MEGAFORTRESS

Based on
Flight of the Old Dog,
Dale Brown's
best-selling novel

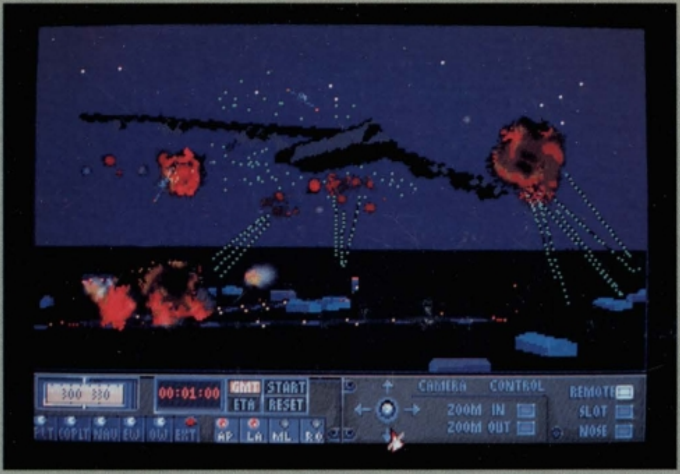
**IBM PC XT / AT &
100% Compatibles**
(10MHZ or higher recommended)

MEGAFORTRESS

Based on
Flight of the Old Dog,
Dale Brown's
best-selling novel

BIG, BAD, AND ARMED TO THE TEETH!

Megafortress is more than just a battle-scarred B-52. It's the enemy's worst nightmare: a nearly-invisible attacker, carrying enough firepower to destroy the most heavily defended installations in the world.



External Camera View: Fight Your Way Past Enemy Defenses To Destroy Target.

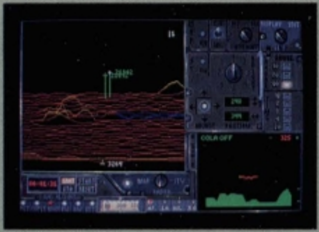
Forget the run-of-the-flight simulators you're familiar with.

Megafortress is in a class by itself: a radically modified B-52H Stratofortress, with radar-absorbing fibersteel skin, an SST nose, and enough state-of-the-art sensing apparatus and weapons systems to jam and blast its way into any place on earth.

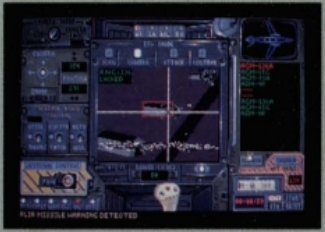
It's a huge, complex aircraft that demands attention to a dizzying array of tasks. Want to know what it's like to deliver 200 tons of mayhem and destruction into the blazing heart of the Iraqi war machine, all the while trying to keep your location a secret? This is the reality of long-range strategic air assault *today*.

You're not just a Pilot, responsible for takeoff and landing, mid-air refueling and other basic maneuvers. As Navigator you'll plot courses across Iraq and the USSR, keeping your missions on track; as Electronic Warfare Officer you're glued to a radar scope, hunting for threats, jamming signals, keeping the aircraft hidden; as Offensive Weapons Officer you have massive firepower at your disposal: air-to-air missiles, anti-radar missiles, and air mine rockets for defense, and powerful TV/infrared guided glide bombs for the final attack.

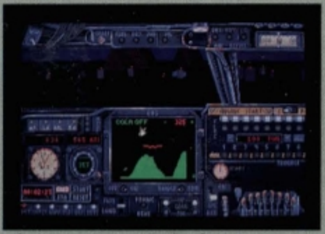
With missions in the Persian Gulf and USSR designed by Dale Brown, B-52 navigator and best-selling author, Megafortress is an adventure into the complex world of strategic air assault.



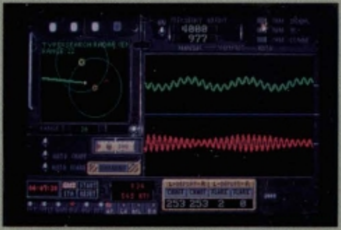
Navigator's Station: Plot Your Course Using On-Board 3D Terrain Mapping Computer.



Infrared Imaging Target Acquisition: Offensive Weapons Officer's Station.



Pilot's Station: On Final To Target.



Electronic Warfare Officer's Screen: Jam Enemy Radar Signals.

FEATURES

- *Multi-position bomber simulation with Pilot, Copilot, Navigator, Electronic Warfare Officer, and Offensive Weapons stations.*
- *Complete electronic countermeasures maximize the "stealthiness" of the Megafortress.*
- *Multiple missions in the Desert Storm theater of Iraq/Kuwait, the eastern USSR, and the USAF Red Flag training area in Nevada.*
- *Arsenal includes the latest in air-to-air and air-to-ground missiles, anti-radar missiles, air mine rockets, standard high-explosive "iron" bombs, and TV/infrared-guided glide bombs.*
- *Terrain guidance radar screens operate at realtime speed.*
- *Full 256 color VGA graphics in a 3D world with universal camera angles.*
- *Sound Blaster and AdLib sound support.*
- *Game includes Dale Brown's bestselling novel,* Flight of the Old Dog.

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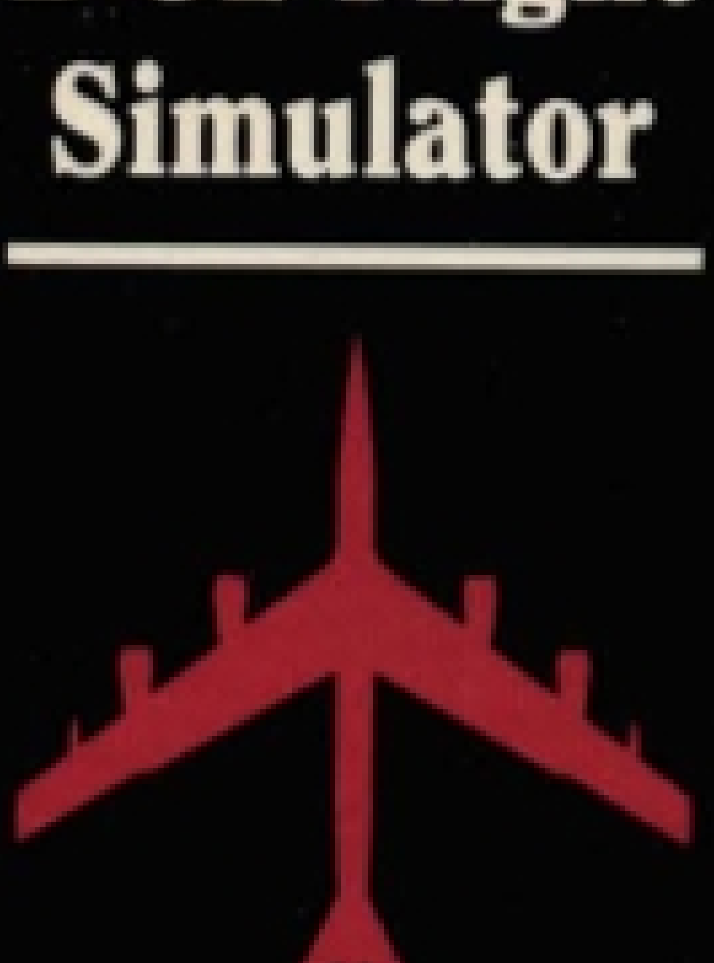
THREE-SIXTY

MEGAFORTRESS

B-52 Flight Simulator



Requires 256 color VGA, DOS 2.11 or higher, & 640K of RAM

Mouse and Hard Drive recommended
Sound Support: Sound Blaster and AdLib

5.25" 1.2Mb disk is enclosed
3.5" 720K disk is available for $5.00

MEGAFORTRESS

FLIGHT MANUAL

MEGAFORTRESS

Computer Simulation

Inspired by the novel, *Flight of the Old Dog*, by Dale "Bear" Brown

Produced by

Three-Sixty Pacific, Inc.

2105 South Bascom Avenue, Suite 380, Campbell, California 95008

For customer service, call (409)776-2187 between 9:00AM and 5:00PM Central Time.

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GLOSSARY

AAA	anti-aircraft artillery
active radar	An active radar (like the OW station "attack" radar) generates a beam of radar energy to create an echo in a radar target. (Please see "Stealth Modifications," Chapter 4.)
AFSATCOM	Air Force Satellite Communications System. (Please see "Navigation," Chapter 4.)
AGL	Above ground level
AGM	Air-to-ground missile
AIM	Air intercept missile
AP	Autopilot
ATC	Air traffic control
CA	Circuit Analog absorber. (Please see "Stealth Modifications," Chapter 4.)
CAP	Combat air patrol
Chaff	Thin slivers of radar-reflective material scattered in clouds to confuse hostile radars
CIC	Command In Control
CSRL	Common Strategic Rotary Launcher
DTM	Data transfer module (Please see "Navigation," Chapter 4.)
DRS	Bomb bay doors
ETA	Estimated time of arrival
EVS	Electro-optical viewing system
FCS	Flight control system(autopilot)
EW-GCI	Early warning-gound control intercept. Soviet and Soviet-trained fighter pilots (such as the Iraquis) are directed to intercept intruders by GCI radar operators. This differs from the American system, which relies more strongly on an individual fighter's radars, Airborne Warning and Communications System (AWACS) aircraft, and Surveillance, Targeting, and Attack Radar System (STARS) aircraft.
EW	Electronic warfare
GMT	Greenwich mean time
GPS	Global Positioning System (Please see "Navigation," Chapter 4.)
HARM	High-speed anti-radiation missile
IFF	Identification friend or foe
jink	To execute a short, rapid turn. For example, to escape a chaff cloud.
kts	Knots, or nautical miles per hour. One nautical mile equals 1.150779 statute miles, or 1.852 kilometers.
LA	Low altitude

loadout	Loadout includes all ordnance and fuel taken on board at the start of a mission.
ML	Missile launch
OAS	Offensive avionics system (Please see "Fire Control," Chapter 4.)
OW	Offensive weapons
passive radar	A passive radar (like the OW station "scan" radar) waits for the normal electromagnetic emissions of an object to strike its antenna. (Please see "Stealth Modifications," Chapter 4.)
RCS	Radar cross section. (Please see "Stealth Modifications," Chapter 4.)
RLIR	Rear-looking infrared. (Please see "Sensor Management," Chapter 4.)
RO	Radar on (refers to the ATTACK radar at the OW station. Please see "OW Station," Chapter 1.)
SAM	Surface-to-air missile
SLAM	standoff land attack missile
standoff capability	A missile's ability to be launched from beyond the normal range of enemy return fire.
STV	Steerable low-light television
TAC	Terrain avoidance computer
TFR	Terrain following radar. (Please see "Stealth Modifications," Chapter 4.)
TFTG	Tactical Fighter Training Group
TFWC	The Tactical Fighter Weapons Center, at Nellis AFB, Nevada.
TRN	terrain referenced navigation. (Please see "Stealth Modifications," Chapter 4.)
UHF	Ultra-high frequency (generally used for radio communication)
USAF	United States Air Force

INTRODUCTION

The EB-52 Megafortress is a complex aircraft, and any faithful description of it demands attention to a number of subjects. From its beginnings as a USAF test aircraft to its missions in the Persian Gulf, the Megafortress combines an almost-incalculable number of technologies into the most formidable long-range strategic bomber in existence today.

This manual is divided into six main chapters, with an additional "Quick Start" section added at the beginning. Two appendices illustrate enemy aircraft and weapons. Flight plans for all missions except The Flight of the Old Dog are included in a special booklet accompanying this manual. Finally, notes by Dale "Bear" Brown, the "father" of the Megafortress, are included.

IMPORTANT

A separate "Installation & Reference" guide accompanies the manual. This important guide provides installation instructions for specific computers, describes both the "mouse/keyboard mode" and "keyboard-only mode" control systems of the Megafortress, and lists all of the "hot key" commands for the aircraft.

QUICK START

This section is for that inevitable overzealous crew that wants to burn while it learns. If you survive, or when the frustration becomes intolerable, come back and read the book.

STATIONS

The aircraft's six stations are described here, with descriptions of all instruments, switches, and functions.

FLIGHT PROCEDURES

These procedures are essential in operating the aircraft: Mission assignment, preflight, takeoff, flying, inflight refueling, landing, and damage control.

STRATEGY & TACTICS

This chapter makes recommendations regarding strategic and tactical considerations. They are recommendations only—in the heat of battle there can be no substitute for the wit and inventiveness of the warrior.

GENERAL BRIEFING

The briefing describes the aircraft in as much detail as possible, given the current restrictions of government clasiffication. A general description is provided, as well as discussions of avionics, miscellaneous systems, and low-observable ("stealth") modifications.

ORDNANCE

Weapons available to the EB-52 are illustrated and described here. Enemy aircraft and weapons are illustrated in Appendices 1 and 2.

MISSIONS

Maps and a brief description of each theatre of operations are provided. A description of each Red Flag training mission is included. Mission details for the Persian Gulf and Flight of the Old Dog are classified, and will be available only during mission assignment or the mission itself.

FLIGHT PLANS

Flight plan maps for each Red Flag and Persian Gulf mission are provided in a separate booklet accompanying this manual.

A salute, and best of luck to you. Crews that master operation of this aircraft will have proved themselves worthy of a huge measure of respect—especially from the enemy.

EB-52 MEGAFORTRESS

Wing span: .... 185 ft.

Fuselage length: ... 160 ft 11 in.

Height

Top of fins: .... 36 ft.

Top of fuselage: . 21 ft 6 in.

Powerplant: .... Eight Pratt & Whitney model TF33-P-3 (JT3D-2) low-bypass turbofan engines.

Max. fuel: .... 192,000 (no rdnance loaded)

Max. ordnance: ..... 50,000 lb.

Gross weight: .... 400,000 lb.

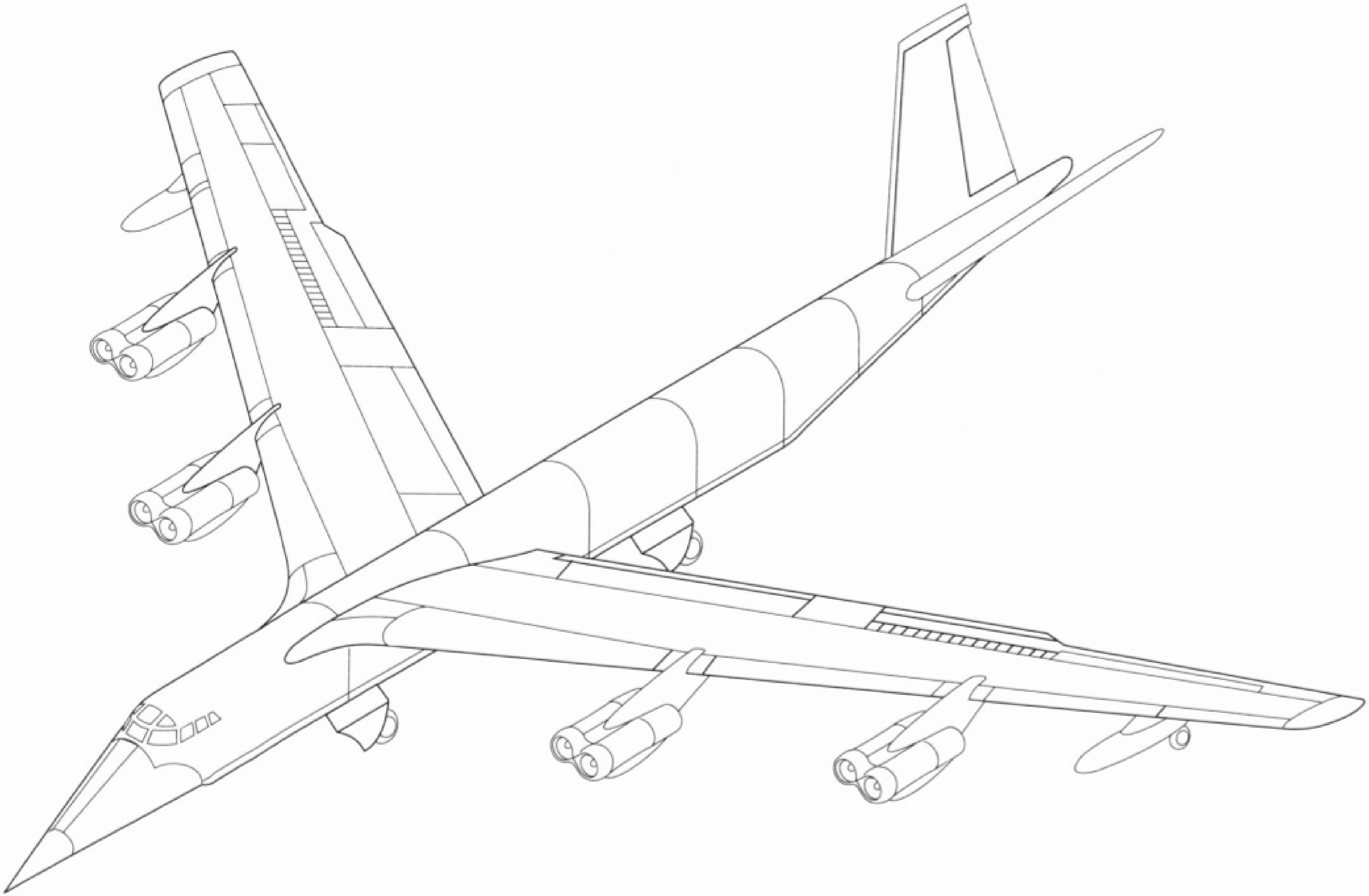
Range: .... 8,800 nm

Max speed: .... .96 Mach

Combat ceiling: .... 47,000 ft.

Low-level: .... 108 ft.

The EB-52 "Megafortress" is a land-based, long-range, multi-role aircraft, primarily designed for heavy bombardment, but also capable of multi-level precision bombing and air-to-air attack and defense. The aircraft accommodates a crew of five: pilot, copilot, navigator, electronic weapons officer (EW), and offensive weapons officer (OW). Provisions have been made to carry and launch approximately 50,000 lbs. of mixed ordnance, including air-to-ground and air-to-air missiles, and clip-in bomb loads. (Please see Chapters 4, "Megafortress Briefing" and 5, "Ordnance.")



QUICK START

For those few novice mission commanders who are impatient with more prudent approaches to learning, we offer the following step-by-step directions for getting the EB-52 Megafortress off the ground as quickly as possible, and an invitation to return to this manual if and when frustration finally overcomes impatience.

NOTE

By flying each of the Red Flag training missions and reading the accompanying descriptions in "Red Flag," Chapter 6, crews will practice every maneuver necessary to the successful completion of the Persian Gulf and Old Dog missions.

This "quick start" mission is divided into four parts: starting the game, taking off, flying to each of the waypoints of the mission, and landing. If along the way the crew manages to hit a few targets—that's a bonus. Survival equals success under these circumstances.

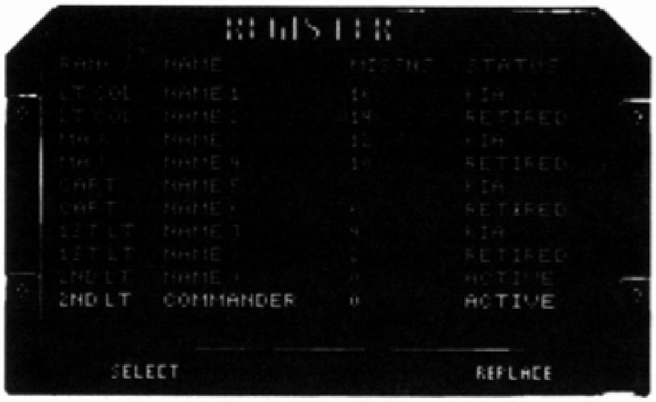
But while it may be possible to explain such a simplified process, there is no guarantee that an inexperienced crew will be able to accomplish it because the actions of any enemy encountered along the way may serve to bring such a "quick start" to a quick finish.

STARTING MEGAFORTRESS

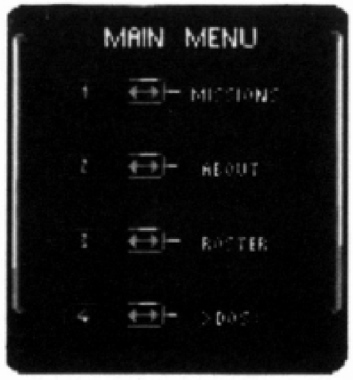
1) Install the program on a hard disk, following the directions provided in the separate piece, "Installation & Reference."

2) Load the program, again following the directions provided in "Installation & Reference."

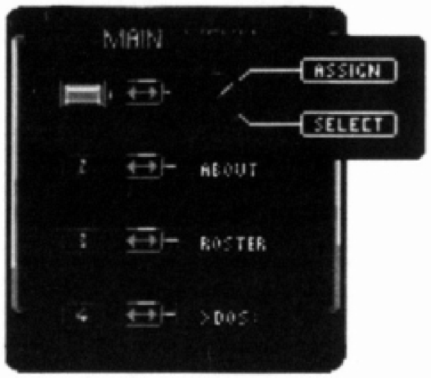
3) Take time to learn how to make selections by reading "Mouse Play" or "Keyboard Play" in the Installation & Reference guide accompanying this manual. (It is *highly* recommended that a mouse be used to operate the EB-52 Megafortress.)



4) Register for your mission in one of the following ways:
   a) Select an active pilot in the registration screen and choose SELECT.
   b) Select the name of a pilot you want to replace, select REPLACE, and type in the name of your pilot. Tap <Return>.

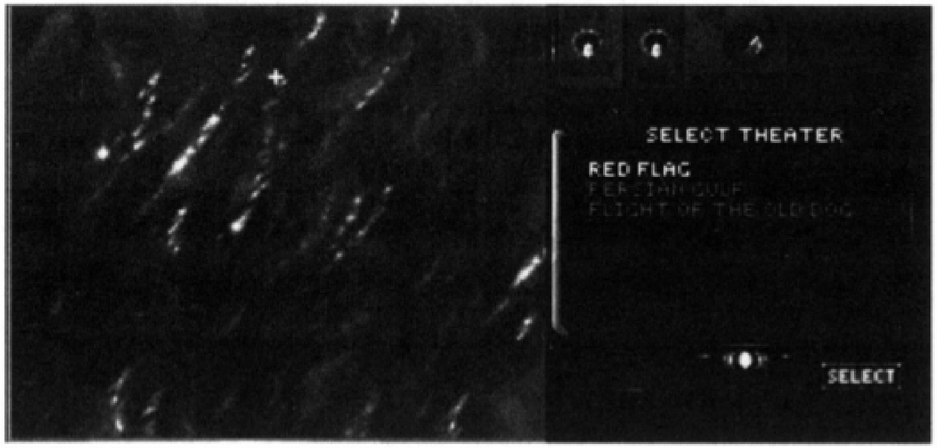

MAIN MENU
1 MISSIONS
2 ABOUT
3 ROSTER
4 >DOS

5) Select MISSIONS on the Main Menu.

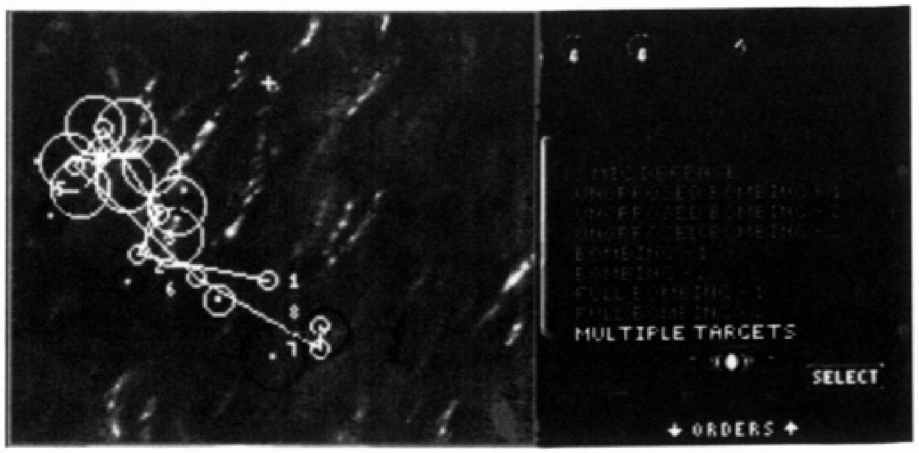

MAIN
ASSIGN
SELECT
2 ABOUT
3 ROSTER
4 >DOS

6) Choose SELECT on the Mission Selection pop-up menu.

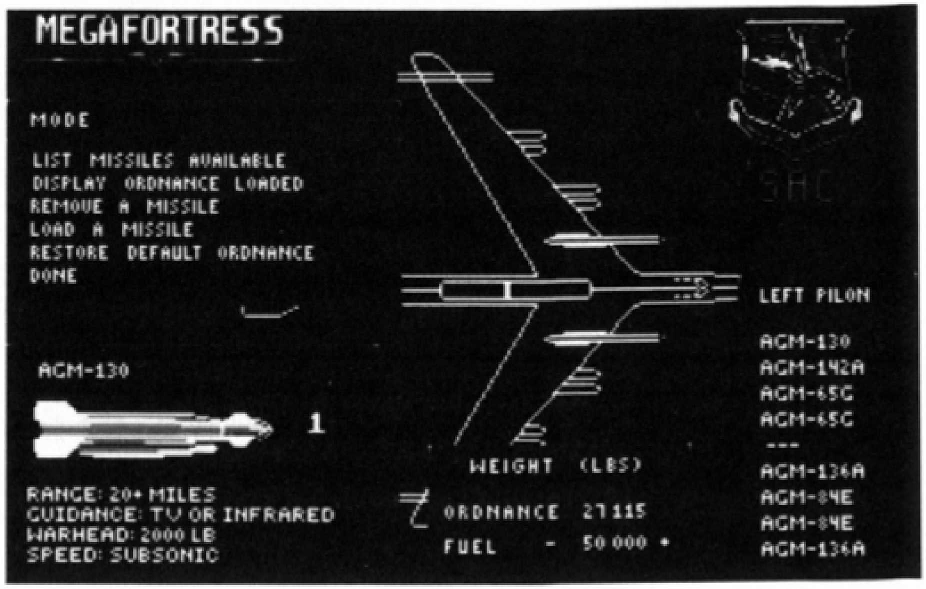
7) Select the geographic area in which you want to fly your mission—Red Flag (Nevada) Persian Gulf, or Flight of the Old Dog—and then choose SELECT. (It is highly recommended that new crewmembers begin with the Red Flag missions.)


SELECT THEATER
RED FLAG
PERSIAN GULF
FLIGHT OF THE OLD DOG
SELECT

8) Select a mission on the scrolling list (scroll the list with the up or down arrows on the side of the list) and choose SELECT.


1
8
7
MULTIPLE TARGETS
SELECT
ORDERS

9) If you select a Red Flag training mission, make sure that the aircraft is filled to capacity with fuel by checking the Weight panel in the Loadout screen. **Fuel *plus* any ordnance loaded should total 192,000 lbs**. If total weight is less, add fuel by selecting the "+" symbol next to the FUEL readout until the total stops increasing.


MEGAFORTRESS
MODE
LIST MISSILES AVAILABLE
DISPLAY ORDNANCE LOADED
REMOVE A MISSILE
LOAD A MISSILE
RESTORE DEFAULT ORDNANCE
DONE
AGM-130
1
SAC
LEFT PILON
AGM-130
AGM-142A
AGM-65C
AGM-65C

AGM-136A
AGM-84E
AGM-84E
AGM-136A

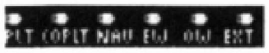
RANGE: 20+ MILES
GUIDANCE: TV OR INFRARED
WARHEAD: 2000 LB
SPEED: SUBSONIC

WEIGHT (LBS)
ORDNANCE 27115
FUEL - 50 000 +

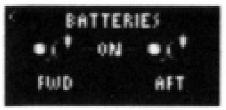
10) Select DONE on the MODE menu in the Loadout screen.

TAKEOFF

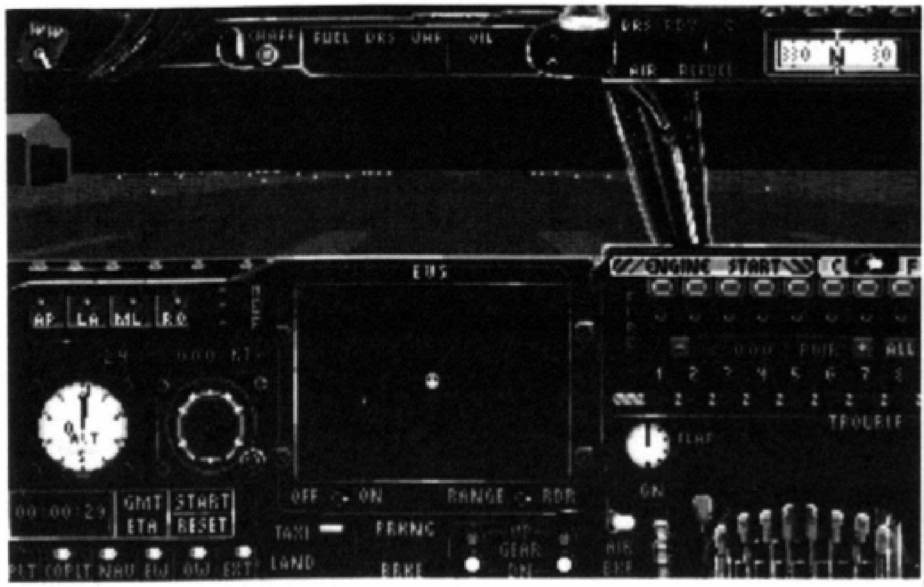
1) Go to the copilot station by selecting the COPLT light in the interphone panel at the lower left corner of the pilot station.



2) Turn on the the two battery switches (the engines will not start without battery power).



3) Return to the pilot station by selecting the PLT light in the interphone panel.



4) Select PRKNG BRAKE to set the parking brake. Its light will illuminate.

5) Select the FLAPS dial to extend flaps for takeoff. The percentage-extended hand will begin to move, extending the flaps in approximately 23 seconds.

6) Switch the TAXI/LAND ratio switch at the bottom of the screen to LAND.

7) Select ALL, on the right side of the Pilot's instrument panel to turn on the engine-ready switches. All eight engine lights will illuminate.

8) Switch the ENGINE START switch to C to ignite the starter cartridges. The engines will start, and the PWR display will show 1%.

9) Switch the ENGINE START switch back to F, to channel electrical power to the aircraft's systems during flight.

10) Increase power in all engines to 100% by selecting "+," to the right of the PWR display.

11) Select PRKNG BRAKE to release the parking brake.

12) When the speed indicator to the left of the Pilot's EVS reads 200 kts, lift off by using the down arrow on the keyboard to pitch the nose of the aircraft up at an angle of 5%. The current pitch angle is displayed in the Artificial Horizon indicator, to the left of the Pilot's EVS.

13) Select "UP" on the GEAR panel to raise the landing gear. (Gear will be damaged if extended at speeds exceeding 375 kts.)

14) Select the FLAPS indicator dial to retract the flaps. (Flaps will be damaged if extended at speeds exceeding 450 kts.)

15) When the aircraft reaches an altitude of 1000 feet, select the AP or autopilot light in the warning panel at the far left side of the pilot station. The automatic flight control system (FCS) will take control of the aircraft and direct it toward the first mission waypoint. (You can override the FCS at any time by steering manually. Use the left- and right-arrow keys to turn the aircraft left or right; use the down- and up-arrow keys to climb or descend. When you release the keys, the FCS will reassume control.)

16) Decrease power to 85% by selecting "-," to the left of the PWR display.

THE MISSION

After you are airborne and en route to the first waypoint, you will have to deal with four types of events (aside from the final challenge of landing): inflight refuelling (Persian Gulf and Flight of the Old Dog only), identification, enemy attack, and target destruction.

INFLIGHT REFUELING

In the Persian Gulf and Flight of the Old Dog missions, you will always need to replace the fuel used during take off in order to complete the mission. Please take a moment to refer to "Flight Procedures: Inflight Refuelling," Chapter 2, for a step-by-step explanation of this procedure.

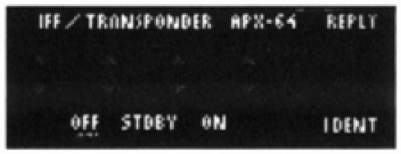
NOTE

If you select one of the Red Flag training missions, you must add additional fuel during Laodout selection to complete the mission. Red Flag mission #4 is designed purely as an exercise in inflight refueling.

IDENTIFICATION

At some point during each mission, the aircraft will be contacted by friendly Air Traffic Control (ATC) and asked to identify itself. The message will appear in the Message Display Line at the bottom of the screen. Identification is accomplished from the Copilot station as follows:

1) Switch the Transponder switch to STBY.



2) The first two digits on the transponder are automatically adjusted to match the 2-digit code transmitted by ground control.
3) The numbers transmitted to the EB-52 correspond to one of the 2-digit page numbers in this manual. Locate that page and note the 2-digit code in parentheses to the right of the page number.
4) Enter the 2-digit code into the last two numbers of the transponder by selecting the arrows to the left of each number.
5) Switch the transponder switch from STDBY to ON.
6) Select the IDENT button. When the REPLY light flashes, identification has been correctly made.

WARNING

Failure to identify correctly will result in the destruction of the aircraft by friendly fire.

CAUTION

The transponder should remain on as long as the aircraft remains in friendly airspace, but be turned OFF before entering enemy territory. The set transmits UHF radio waves and will attract immediate attention from enemy ground installations. The UHF warning light on the pilot's screen illuminates when the transponder is on.

ENEMY ATTACK

Enemy attacks come either from the ground or air, and you have three options in dealing with them:

1) Fly as low as possible, using features in the terrain to evade the pursuer.

2) Evade or disrupt attacks using contermeasures available at the EW station. These include active jamming of enemy radars and infrared tracking systems, dispensing chaff and flares to confuse enemy missiles, and disrupting enemy communications.

   Complete information on the use of these defensive systems is included in "Electronic Warfare Station," Chapter 1.

3) Counterattack using weapons available at the OW station. Enemy aircraft can be attacked, ground-based radars and missile installations eliminated, enemy airfields rendered unusable, and so on using the OW systems.

   Complete information on the use of these offensive systems is included in "Offensive Weapons Station," Chapter 1.

TARGET DESTRUCTION

Mission targets can include anything from buildings and bridges to enemy radars and airfields. Review the targets at any time by going to the navigator station and changing the Mode Select Switch to NAV.

The preprogrammed waypoints of each mission are located at or near the mission targets (please see "Navigator Station," Chapter 1). As you approach each waypoint, go to the OW station and search for the target by using the OW monitor either in SCAN (for radar-emitting targets) or CAMERA (for buildings, bridges, etc.) mode.

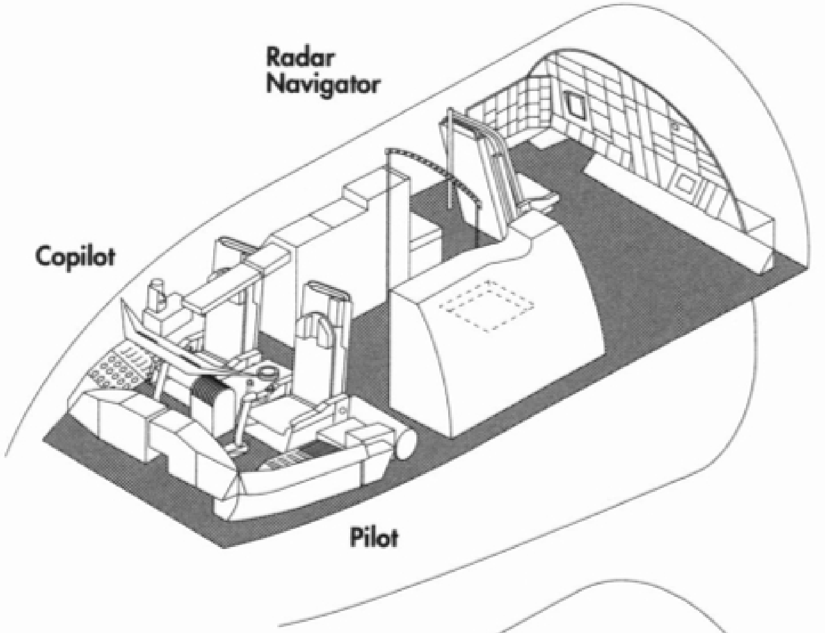
As described in "Enemy Attack" above, different targets require different weapons and delivery techniques (please see "Ordnance," Chapter 5). Complete information on the use of these offensive systems is included in Chapter 3.

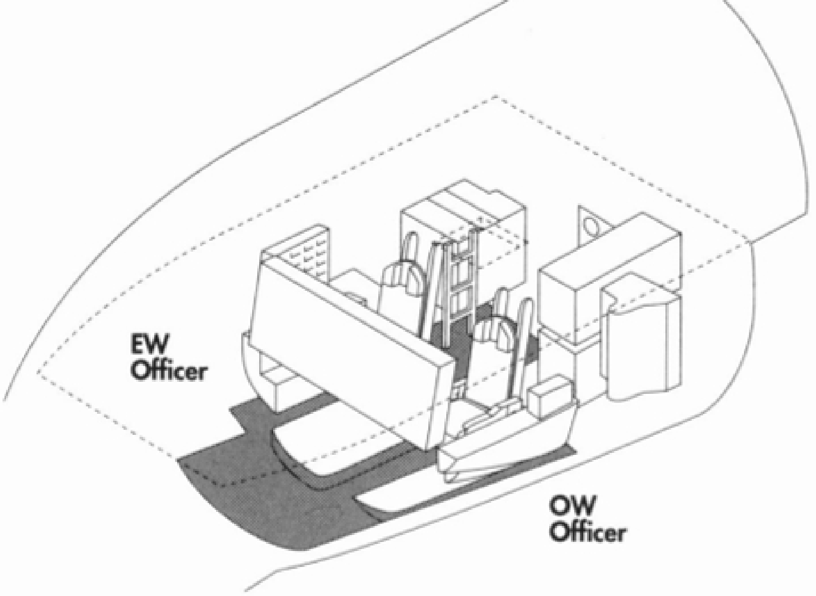
LANDING

For a complete description of landing procedures, please refer to "Flight Procedures: Landing," Chapter 2.

1 STATIONS

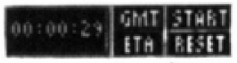
There are five crew stations and one external camera observation station in the aircraft, each with its own special instruments, displays, and functions. In addition, five common, or "muti-station" instruments are located at every station.





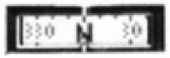
MULTI-STATION INSTRUMENTS

Clock



1) GMT is Greenwich Mean Time.
2) ETA is the aircraft's estimated time of arrival at the next waypoint at the current speed.
3) START/RESET operates a stopwatch. This instrument can be particularly useful during bombing runs.

Compass

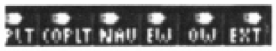


The compass displays magnetic direction and cannot be damaged.

Message Display Line

The bottom margin of the screen displays all messages transmitted by interphone between crew members, and all communication to the aircraft from ground controllers and airborne surveillance systems.

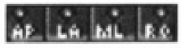
Interphone Panel


PLT
COPLT
NAV
EW
OW
EXT

Click any light on the Interphone Panel to go to one of the Megafortress stations.

1) If a light is on and steady, it indicates the station currently shown.
2) If a light is flashing, its corresponding station requires attention.
3) If the INTERPHONE switch at the copilot's station (please see "Copilot Station," this chapter) is turned off, the panel will not operate.

Warning Panel



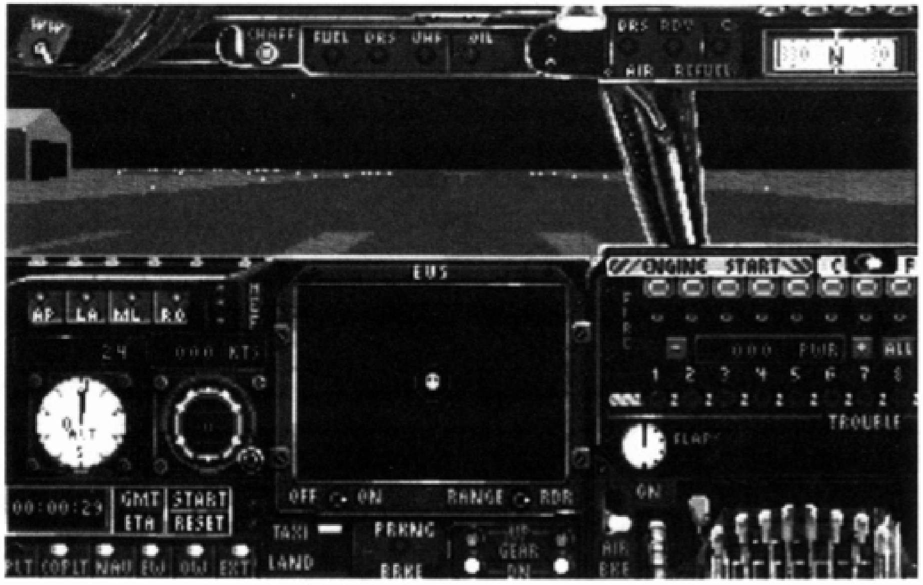
The warning panel is made up of four lights—one selector light and three warning lights.

1) AP (autopilot): When the autopilot selector light is selected, the aircraft's digital automatic Flight Control System (FCS) automatically flies the aircraft along the programmed course of waypoints, temporary waypoints, and altitudes set at the navigator's station (please see "Navigator Station: MAP Panel," this chapter). The FCS can be overridden manually at any time, but reassumes command immediately when manual control is relinquished.
2) LA (low altitude): The LA warning light flashes when the airplane descends below the altitude set on the terrain avoidance computer (TAC), even if the TAC is not on. (Please see "Pilot Station," this chapter.)
3) ML (missile launch): the ML warning light flashes when an infrared- or radar-guided missile tracks the aircraft. The ML warning light is slaved to the EW Officer's Missile Launch warning light. (Please see "EW Station," this chapter).
4) RO (radar on): The RO warning light illuminates whenever the airplane's AN/APQ-166 active ("attack") radar is on at the OW Officer's station.

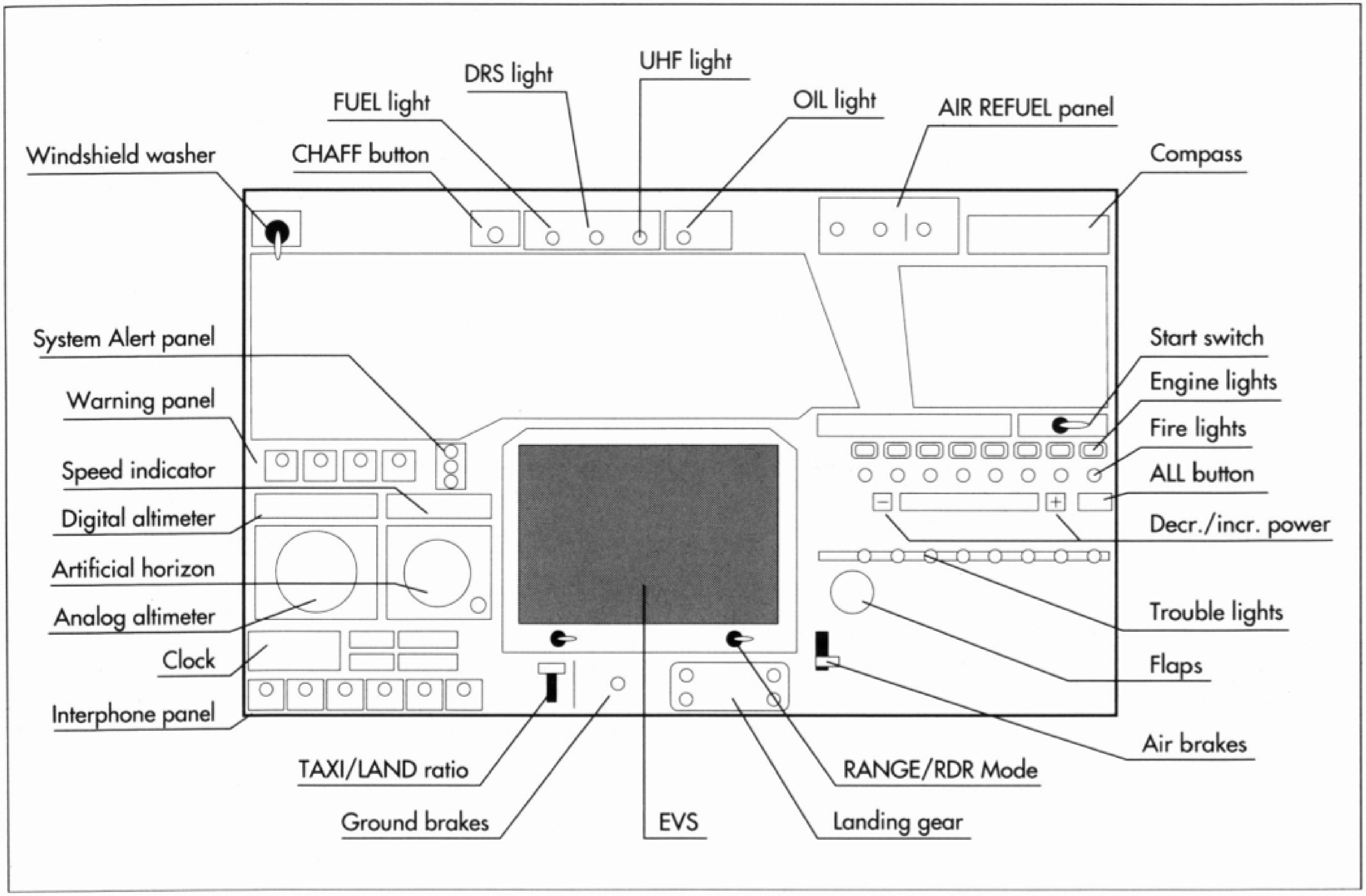
CAUTION

The active radar dramatically increases the radar cross section (RCS) of the aircraft (Please see "Stealth Modifications," Chapter 4).

PILOT STATION


CHAFF
FUEL
DRS
UHF
OIL
AIR REFUEL
N
EVS
ENGINE START
AP
LA
ML
RO
KTS
ALT
00:00:29
GMT
START
ETA
RESET
OFF
ON
RANGE
RDR
TAXI
LAND
PRKNG
BRKE
GEAR
ON
FLAPS
TROUBLE
PWR
ALL
AIR
BRK
PLT
COPLT
NAV
EW
OW
EXT

The pilot is the aircraft commander, and is responsible for the issuance of instructions governing all phases of flight operation, especially including takeoff, flying the aircraft, inflight refueling, damage control, and landing.


DRS light
UHF light
FUEL light
OIL light
AIR REFUEL panel
Windshield washer
CHAFF button
Compass
System Alert panel
Start switch
Engine lights
Warning panel
Fire lights
Speed indicator
ALL button
Digital altimeter
Decr./incr. power
Artificial horizon
Analog altimeter
Trouble lights
Clock
Flaps
Interphone panel
Air brakes
TAXI/LAND ratio
RANGE/RDR Mode
Ground brakes
EVS
Landing gear

CHAFF Button

Select the CHAFF button to eject two chaff bundles—one from each wing. (Please see "Electronic Warfare Station," this chapter.)

FUEL Light

The fuel light flashes when the aircraft has enough fuel remaining for 10 minutes of flight at the maximum power setting; the light stops flashing and burns steadily when there is enough fuel remaining for 5 minutes of flight. (Please see "Fuel" under "Copilot Station," this chapter.)

DRS Light

The DRS light illuminates when the bomb bay doors are opened. Flying with the bomb bay doors open increases RCS and slows the airplane. (Please see "OW Station: Master Bomb Control," this chapter, and "Stealth Modifications," Chapter 4.)

UHF Light

The UHF light illuminates when UHF signals are being generated by the aircraft. Such signals generally come from from the Copilot's transponder.

OIL Light

The oil warning light illuminates when one or more of the engines is low on oil. The oil light generally indicates that engine trouble is about to occur, or is occurring.

AIR REFUEL Panel (Please see "Inflight Refueling," Chapter 2.)

C Light

Select the "C" contact light to lock onto a refueling tanker's radar signal. The signal must be selected in the pilot EVS radar (please see "EVS," below) and the FCS (please see "Warning Panel: AP," above) must be on for the EB-52 to automatically redirect its flight path toward the tanker in preparation for rendezvous. (Please see "Inflight Refueling," Chapter 2, and try Red Flag training mission #4.)

RDY Light

The ready light illuminates when the EB-52 has successfully rendezvoused with a refueling tanker. Fueling can begin.

DRS Light

Select the refueling DRS light to open the slipway doors and begin inflight refueling.

System Alert Panel

H

The hydraulic system warning light flashes when the aircraft hydraulic system is malfunctioning. (Please see "Copilot Station," this chapter, and "Damage Control," Chapter 2.)

E

The electrical system warning light flashes when the aircraft electrical system is malfunctioning. (Please see "Copilot Station," this chapter, and "Damage Control," Chapter 2.)

F

The flight systems warning light flashes in response to a variety of flight-oriented problems. (Please see "TAXI/LAND Ratio Switch," this chapter, and "Damage Control," Chapter 2.)

Digital Altimeter

The digital indicator monitors the AN/APN-224 radar altimeter and registers altitude above ground level (AGL) in feet.

Analog Altimeter

The analog altitude indicator registers altitude above sea level. The black hand indicates 100s of feet; the red hand indicates 1000s of feet.

WARNING

It is important to note the difference between the two altitude indicators. Generally the digital altimeter is the more important instrument of the two to the pilot, as it records the current distance between the aircraft and the ground. The analog indicator is useful in its graphic representation of changes in altitude.

Artificial Horizon Indicator

The lines on the Artificial Horizon indicate the degree of roll, from side to side; the numbers indicate the degree of pitch, forward and back.

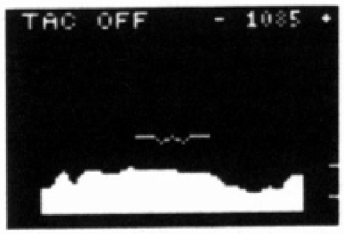
EVS OFF/ON switch

The EVS OFF/ON switch must be turned on for any of the electro-optical viewing system (EVS) functions to operate.

EVS RANGE/RDR mode switch

1) In RDR mode, the pilot's EVS monitor displays information from either the EW station's passive radar, or the OW station active radar if the OW radar is operating in "attack" mode. (Please see EW and OW stations, this chapter.)

2) In RANGE mode, the EVS presents a low-resolution display of the world ahead of Megafortress. Features include:



A) Low-resolution profile of the terrain between the aircraft and a line 10, 20, or 40 miles distant—depending on the range currently set in the Radar panel at the Navigator's station.

B) "Batwing" symbol representing the EB-52, showing its altitude relative to the horizon line.

C) Two short lines on the right-hand margin of the monitor, indicating the lowest and highest levels of terrain between airplane and the horizon line. (These are often together at the bottom of of the EVS, indicating flat, featureless terrain.)

D) Terrain Avoidance Computer (TAC) interface. The TAC can be turned on and off (by selecting the word ON or OFF) and set to any altitude between 108 and 1085 feet (by selecting the + or - sign). When the TAC is turned on, the aircraft will maintain the selected altitude AGL, overriding the programmed waypoint altitude if the autopilot is on, or automatically whenever manual control of the airplane is relinquished. (Please see "Terrain Referenced Navigation," Chapter 4.)

NOTE

Whether or not the TAC is turned on, when something in the approaching terrain is less than 15 miles away and higher than the altitude selected on the TAC, the Low Altitude (LA) warning light flashes. If the TAC is turned on, the airplane will fly up and over the obstruction unless overridden manually.

WARNING

The TAC, when presented with an abrupt vertical obstruction, will attempt to maintain the programmed altitude by putting the aircraft into a steep climb. Without sufficient power to maintain the climb, the aircraft will stall. At the low altitudes maintained by the TAC, this would be extremely hazardous.

PRKNG BRKE selector

1) If the parking brake is on while the airplane is on the ground, the plane will not move.

2) If the the parking brake is on while the plane is airborne with landing gear down, the F (flight systems) warning light will flash.

TAXI/LAND ratio switch

The steering ratio selector mechanically limits ground-based steering angles for two conditions: a taxi ratio allows the forward gear to be turned to a maximum angle of 55° right or left of center during ground-based maneuvering; the second ratio is used for takeoff and landing, restricting the turning angle to approximately 12° left or right of center.

1) If the switch is set to TAXI and speed is less than 20 kts while the plane is on the ground, the plane can be steered with the same controls used to fly the plane in the air.
2) If the switch is set to TAXI and speed exceeds 20 kts while the plane is on the ground, the F (flight systems) warning light will flash and the course of the plane will be extremely difficult to control.
3) If the switch is set to LAND and speed is less than 20 kts while the plane is on the ground, the F (flight systems) warning light will flash and the plane will not turn.

In short, the TAXI/LAND ratio switch should be set to LAND when taking off and landing, and to TAXI when the ground-based speed drops below 20 kts and maneuvering is necessary.

GEAR UP/DN selector

The GEAR UP/DN selector raises and lowers the landing gear.

1) If any engine drops to 10% power or less and the gear is NOT down, the engine's trouble light will flash until the engine is turned off.
2) If the gear is down while the plane is in the air, the plane's speed will be reduced and its RCS will be increased.
3) If speed exceeds 400 kts with the landing gear down, the gear will be damaged.

Engine Panel (right of EVS)

The engine panel has controls for starting and stopping the engines, as well as increasing and decreasing their power. Lights corresponding to each engine indicate whether the engine is on, whether it is on fire, or whether some other trouble is affecting its performance. (Please also see "Damage Control," Chapter 2.)

For a complete description of the engine start procedure, please see "Flight Procedures," Chapter 2.

ENGINE START C/F

1) To turn the engines on, either as a group or individually, the START switch must be in the F (flight) position.
    A) When the START switch is in the F (flight) position, the engines' electrical systems are turned on either as a group by selecting ALL, or individually by selecting each engine's light.
2) After the engines (or engine) have been turned on, the START switch must be moved to the C (cartridge) position in order to ignite the engines. Then the start switch should be returned to the F (flight) position.
3) To restart an engine (or engines) in flight, the above sequence must be repeated, but only for those particular engines. Do not use the ALL button except when all engines need to be started at the same time.
4) When the start sequence is complete, the engines can be controlled individually by selecting one of throttle handles at the bottom right corner of the instrument panel, or as a group by selecting either the plus or minus sign alongside the digital PWR display.

CAUTION

Selecting ALL switches all the engines to the state opposite the current state of engine 1. That is, if engine 1 is off, selecting ALL turns all of the engines on and vice versa.

FIRE Lights

The engine fire lights flash if one or more of the engines is on fire, and stay lit if an engine is burnt out.

WARNING

Fire in one engine will spread to the other engine in the same nacelle, and to the next nacelle and so on if the engine is not turned off. For example, fire in engine 2 will spread to engine 1, and on to engines 3 and 4 if not stopped. (Please see "Damage Control," Chapter 2)

TROUBLE Lights

Trouble lights correspond to each engine. A flashing trouble light can indicate any number of problems, including oil leaks and damage beyond the diagnostic powers of the aircraft computers. Please see "Damage Control," Chapter 2.

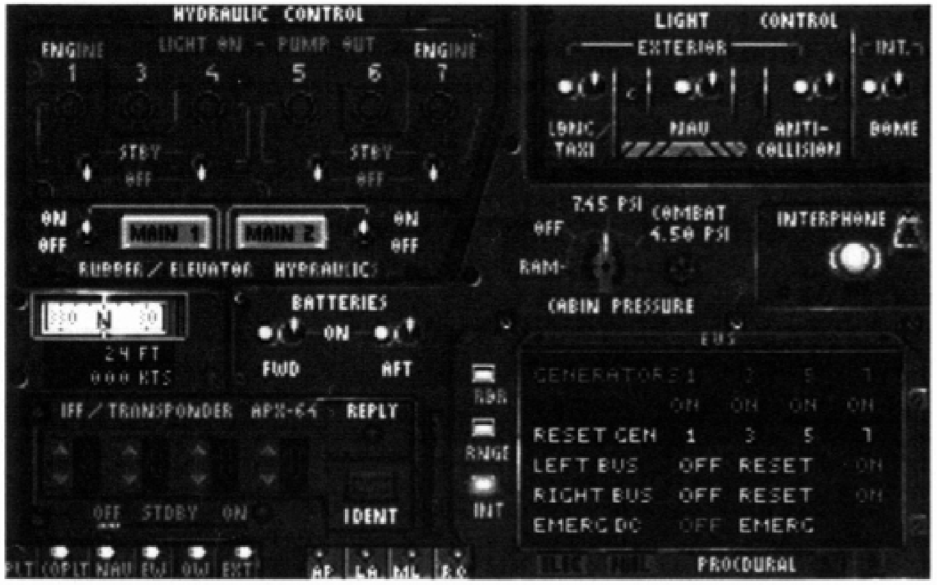
FLAPS

1) Flaps are extended by selecting the FLAPS indicator.
2) It takes 21 seconds for the flaps to extend or be retracted.
3) If the aircraft is on the ground and power exceeds 75% with the flaps RETRACTED, the F (flight systems) and engine trouble warning lights flash.
4) If the aircraft attempts to take off without the flaps fully extended, takeoff requires a longer run and higher speed.

AIR BRAKE

1) When the airplane is in flight, selecting the air brake raises the wing spoilers on both wings, causing a dramatic decrease in speed.

COPILOT STATION

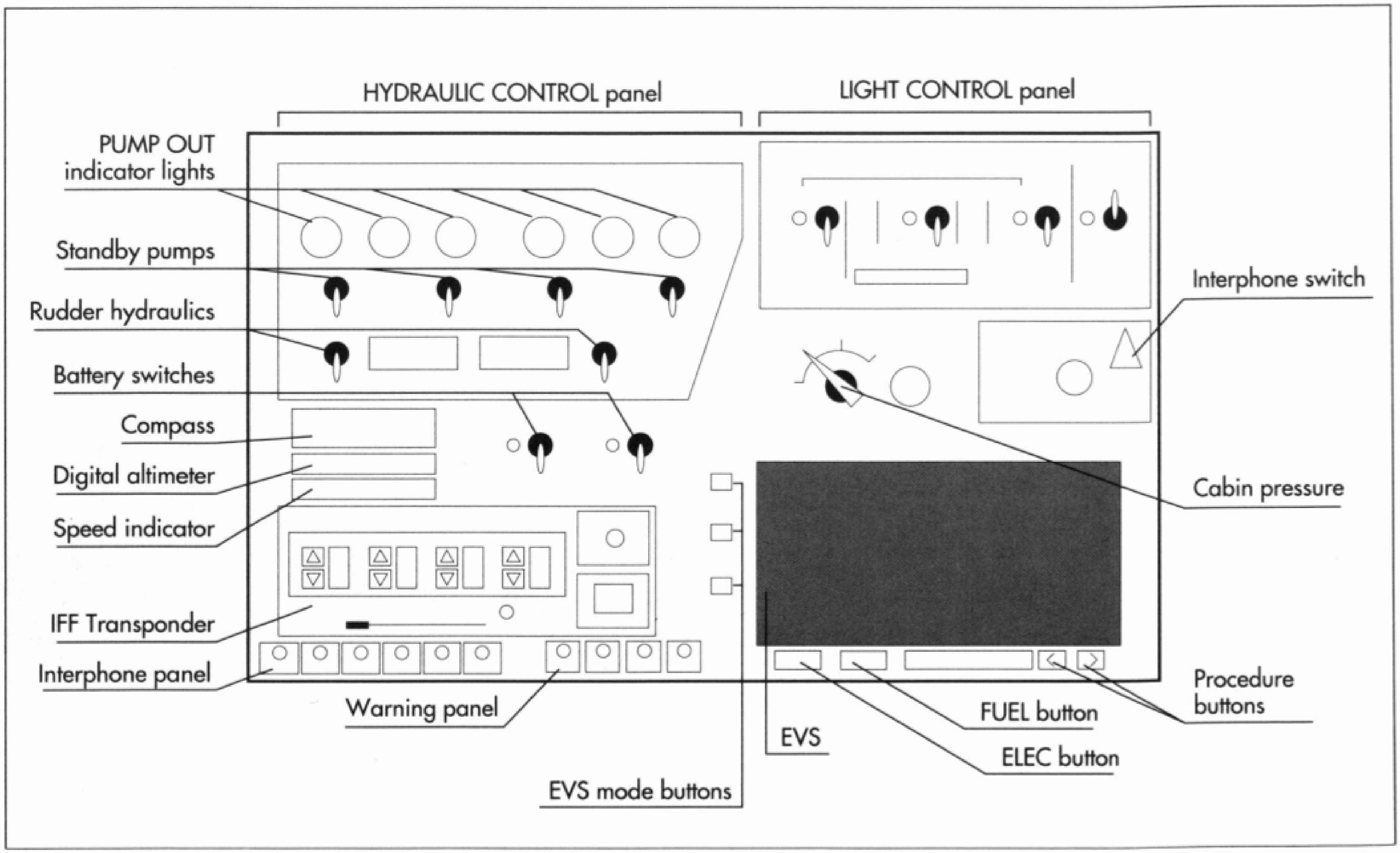

HYDRAULIC CONTROL
ENGINE
LIGHT ON - PUMP OUT
ENGINE
1
3
4
5
6
7
STBY
OFF
STBY
OFF
ON
OFF
MAIN 1
MAIN 2
ON
OFF
RUDDER / ELEVATOR HYDRAULIC
24 FT
000 KTS
BATTERIES
ON
FWD
AFT
IFF / TRANSPONDER APX-64
REPLY
OFF STDBY ON
IDENT
RDR
RNGE
INT
LIGHT CONTROL
EXTERIOR
INT.
LDNG/TAXI
NAV
ANTI-COLLISION
DOME
7.45 PSI
COMBAT 4.50 PSI
OFF
RAM
CABIN PRESSURE
INTERPHONE
BUS
GENERATORS 1 3 5 7
ON ON ON ON
RESET GEN 1 3 5 7
LEFT BUS OFF RESET ON
RIGHT BUS OFF RESET ON
EMERG DC OFF EMERG
PROCDURAL
PLT
COPLT
NAV
EW
OW
EXT
AP
LA
ML
RO

The Copilot is the deputy aircraft commander and assists the pilot in the proper flight of the aircraft. Inasmuch as fuel, electrical, hydraulic, pressurization, communications, and other systems are controlled by the copilot, he also acts as flight engineer.

HYDRAULIC CONTROL Panel

NOTE

Many of the EB-52's mechanical systems are operated hydraulically, including the landing gear, brakes, ground steering, flaps, spoilers, CSRL, rudders, bomb bay doors, and inflight refueling doors. For a detailed description of the hydraulic system, please see "Megafortress Briefing: Hydraulic System," Chapter 4.


HYDRAULIC CONTROL panel
LIGHT CONTROL panel
PUMP OUT indicator lights
Standby pumps
Rudder hydraulics
Battery switches
Compass
Digital altimeter
Speed indicator
IFF Transponder
Interphone panel
Warning panel
EVS mode buttons
EVS
FUEL button
ELEC button
Procedure buttons
Cabin pressure
Interphone switch

If engines 1, 3, 4, 5, 6, or 7 is off, its hydraulic pump is also off (engines 2 and 8 do not have hydraulic pumps.). This results in the following conditions:

1) The PUMP OUT light goes ON.

2) The COPLT light on the Interphone Panel flashes at all other stations.

3) The "H" warning light flashes at the pilot's station.

4) If an engines 1, 4, 5, or 7 cannot be restarted, their electric standby pumps can be turned on by selecting the corresponding STDBY switch.

5) Pumps for engines 3 and 6 operate the inboard spoilers. If 3 and 6 are out, plane loses longitudinal roll capability. i.e.— it won't turn as fast.

6) Pumps for engines 1 and 7 operate the outboard spoilers. If 1 and 7 are out, the plane loses more longitudinal roll capability.

7) Pumps for engines 4 and 5 operate the landing gear and ground brakes. If 4 and 5 are out and their standby pumps cannot be turned on, emergency electrical backup power for the standby pumps may be available through the co-pilot's EVS operating in INT mode (see below). If supplying emergency power does not work, the pumps are damaged beyond repair.

Rudder/Elevator Hydraulics

Each of the two rudders on the plane's V-tail has its own system and backup.

1) At least one must be turned on for the plane to turn or pitch up or down.
2) If one rudder goes out due to excessive damage or the copilot turning it off, the plane gets harder to control.
3) If both rudders are out—best of luck.

Batteries

NOTE

Two electrical distribution buses supply power to the left and right sides of the aircraft. Primary power is supplied by four engine-driven generators and constant-speed drives mounted on engines 1, 3, 5 and 7. For a detailed description of the electrical system, please see "EVS: ELEC Button," below, and "Megafortress Briefing: Electrical System," Chapter 4.

1) Both battery switches must be ON to start engines.
2) After the engines have been started, battery switches should be turned OFF.
3) If engines 1, 3, 5, and 7 begin to go out the load placed on the system may start to exceed available power, causing other systems to go down in turn. Batteries must be turned ON to handle emergency-priority circuits only, but every effort must be made to conserve power; battery capacity is limited to 20 minutes of emergency power.
4) If engines 1, 3, 5, and 7 all are out, batteries must be turned ON to supply dc to essential emergency systems (please see "Damage Control," Chapter 2).

LIGHT CONTROL Panel

There are three exterior and one interior light switch on the LIGHT CONTROL panel.

1) When the mission begins the interior DOME light is always ON. Turning off the DOME light turns the crew compartment lights out.
2) There are three LDNG/TAXI lights mounted on the plane: one halfway down each wing, and the third on the right forward landing gear. These light up the runway ahead of the plane during landing and ground operations and aid air traffic control (ATC) in tracking the plane visually during takeoff and landing procedures.
3) The plane's NAV lights consist of four red and green beacons on the plane's left and right wingtips and two rudders, and three white beacons: one on top of the fuselage and one to either side of the bomb bay doors. They are visible from a great distance in clear weather and should be turned off in enemy airspace.
4) Three ANTI-COLLISION lights, one on each side of the fuselage and one on the bottom of the fuselage, are used to safeguard against inflight collision. They are visible from a great distance in clear weather and should be turned off in enemy airspace.

CABIN PRESSURE

A wing leading-edge manifold is the source for the airplane's bleed air system, which collects and routes high pressure hot air. This bleed air is the power source for inflight engine starting and the air source for heating, cooling, and pressurizing the crew compartment. A retractable ram airscoop located on the left side of the fuselage provides an emergency source of ram air for cooling and ventilating the crew compartment.

1) At altitudes above 9,000 feet, cabin pressure switch must be turned to standard 7.45 PSI, or to 4.50 PSI combat setting if severe changes in altitude are expected during rapid maneuvering.
2) If the cabin pressure system is damaged or turned off at altitudes above 9,000 feet, complaints from the crew are broadcast on the interphone.
3) Emergency cooling and ventilation can be provided by turning CABIN PRESSURE switch to RAM.

INTERPHONE

Interphone messages are broadcast via the Interphone panel at each station, and along the bottom edge of the display. Messages from the AFSATCOM system (please see "MF Briefing," Chapter 4), the command radio and liaison radio systems, and crew members, are routed through the interphone to every station in the message display line. A flashing light in the Interphone Panel (please see "Multi-station Instruments," above) indicates that its corresponding station requires attention.

1) The interphone switch must be ON for the message traffic to be routed to the Interphone panel, or to the bottom of the display.

TRANSPONDER

The AN/APX-64 IFF transponder is the airborne portion of a two-way link between the aircraft and ground radar installations. The ground radar station sends an interrogation signal which is received by the aircraft; the aircraft transponder (reply system) replies with coded signals that are received on the ground and displayed on the radar scope as unique identification and altitude signals. In addition the transponder contains provisions for transmission of an "identification of position" (IDENT) signal.

WARNING

Failure to identify the aircraft correctly when contacted by air traffic controllers will result in the destruction of the aircraft by friendly fire.

In the vicinity of the first waypoint or any other friendly radar site, the aircraft may be contacted by friendly ATC and identification requested.

1) Switch the Transponder switch to STBY.
2) The first two digits on the transponder are automatically adjusted to match the 2-digit code transmitted by ground control.
3) The numbers transmitted to the EB-52 correspond to one of the 2-digit page numbers in this manual. Locate that page and note the 2-digit code in parentheses to the right of the page number.
4) Enter the 2-digit code into the last two numbers of the transponder by selecting the arrows to the left of each number.
5) Switch the transponder switch from STDBY to ON.
6) Select the IDENT button. When the REPLY light flashes, identification has been correctly made.

WARNING

The transponder should remain on as long as the aircraft remains in friendly airspace, but be turned OFF before entering enemy territory. The set transmits UHF radio waves and will attract immediate attention from enemy ground installations. The UHF warning light on the pilot's screen illuminates when the transponder is on.

EVS

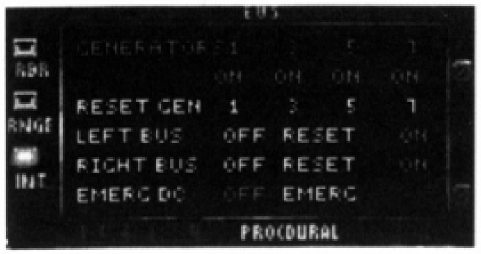
The copilot's EVS operates in any of three modes:

RDR Mode: In RDR mode, the copilot's EVS monitor displays information from either the EW station's passive radar, or the OW station active radar if the OW radar is operating in "attack" mode. (Please see "EW" and "OW" stations, this chapter.)

RNGE Mode: When the copilot EVS is in RNGE mode, it is slaved to the pilot's EVS in RANGE mode.

INT Mode: When the copilot EVS is in INT mode, it provides control over the internal electrical and fuel systems. In emergencies it is used to reset electrical circuits and transfer fuel. (Please see "Damage Control," Chapter 2.)

ELEC button



GENERATORS 1 3 5 7
ON ON ON ON
RESET GEN 1 3 5 7
LEFT BUS OFF RESET ON
RIGHT BUS OFF RESET ON
EMERG DC OFF EMERG

When the ELEC button at the bottom of the EVS is selected, the screen allows control of each main ac generator, the left and right bus circuits, and the emergency dc power supply.

1) If any of the circuits or generators needs to be reset for any reason, the COPLT light on the Interphone Panel flashes at all other stations.

2) If any of the circuits or generators needs to be reset for any reason, the "E" warning light flashes at the pilot's station.

3) If any of the main generator engines (1, 3, 5, or 7) is turned off, the corresponding status light in the second row of the EVS reads "BKUP," and backup electrical power is supplied automatically.

4) If any of the main generators' engines (1, 3, 5, or 7) is damaged, the corresponding status light in the second row of the EVS reads "OUT," and the generator must be RESET manually by selecting the appropriate engine number in the third row of the EVS.

5) If engines 1 and 3 are damaged together, then
   A) Reset the LEFT BUS by selecting RESET in the fourth row of the EVS.
   B) Reset the generators by selecting the appropriate engine numbers in the third row of the EVS

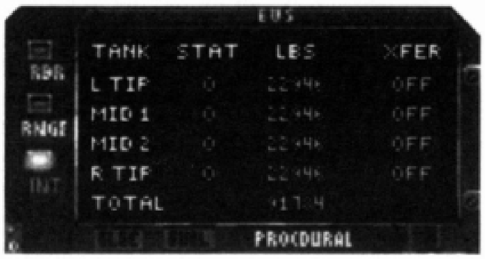
6) If engines 5 and 7 are damaged together, then
   A) Reset the RIGHT BUS by selecting RESET in the fifth row of the EVS.
   B) Reset the generators by selecting the appropriate engine numbers in the third row of the EVS

7) If the electrical system fails and cannot be reset, the EMERG DC system should be turned ON by selecting EMERG from the sixth row of the EVS. (This is procedure is especially important in supplying the hydraulic system backup pumps with power. Please see "Hydraulic Control Panel," above, and "Damage Control," Chapter 2.)

WARNING

Emergency power will be exhausted in approximately 20 minutes.

FUEL button



TANK	STAT	LBS	XFER
L TIP	○	[illegible]	OFF
MID 1	○	[illegible]	OFF
MID 2	○	[illegible]	OFF
R TIP	○	[illegible]	OFF
TOTAL		[illegible]	

When the FUEL button at the bottom of the copilot's EVS is selected, the screen permits control of the aircraft's four main fuel tanks, two mounted outboard at each wingtip, and two internal wing tanks.

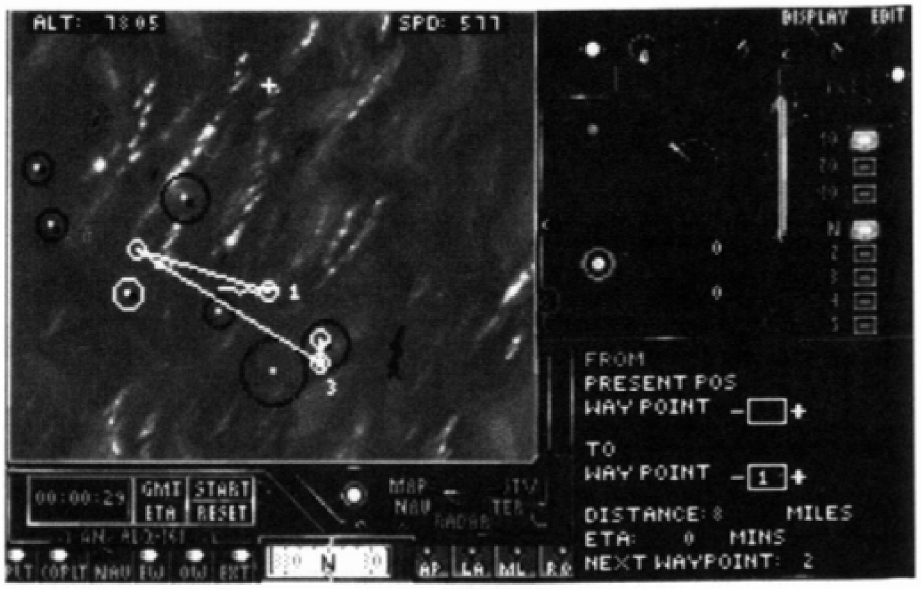
Each of the four main tanks supplies the two engines closest to it: L TIP supplies engines 1 and 2, MID 1 supplies engines 3 and 4, MID 2 supplies engines 5 and 6, and R TIP supplies engines 7 and 8.

1) If any of the fuel tanks is damaged and requires attention, the COPLT light on the Interphone Panel flashes at all other stations.
2) If any of the fuel tanks is damaged, its STAT light turns from green to red.
3) A damaged fuel tank leaks fuel at double the rate of normal fuel consumption. To avoid losing the fuel in a damaged tank, it is necessary to transfer its remaining fuel to the other, undamaged tanks. To transfer fuel:
    i) Select the XFER switch (the word OFF) next to the damaged tank. The fuel will be transferred automatically.

PROCEDURAL buttons

When either of the two PROCEDURAL arrow buttons at the bottom of the copilot's EVS is selected in turn, the screen displays checklists of procedures regarding operation of the aircraft.

NAVIGATOR STATION



ALT: 7805

SPD: 577

FROM
PRESENT POS
WAY POINT –☐+

TO
WAY POINT –1+

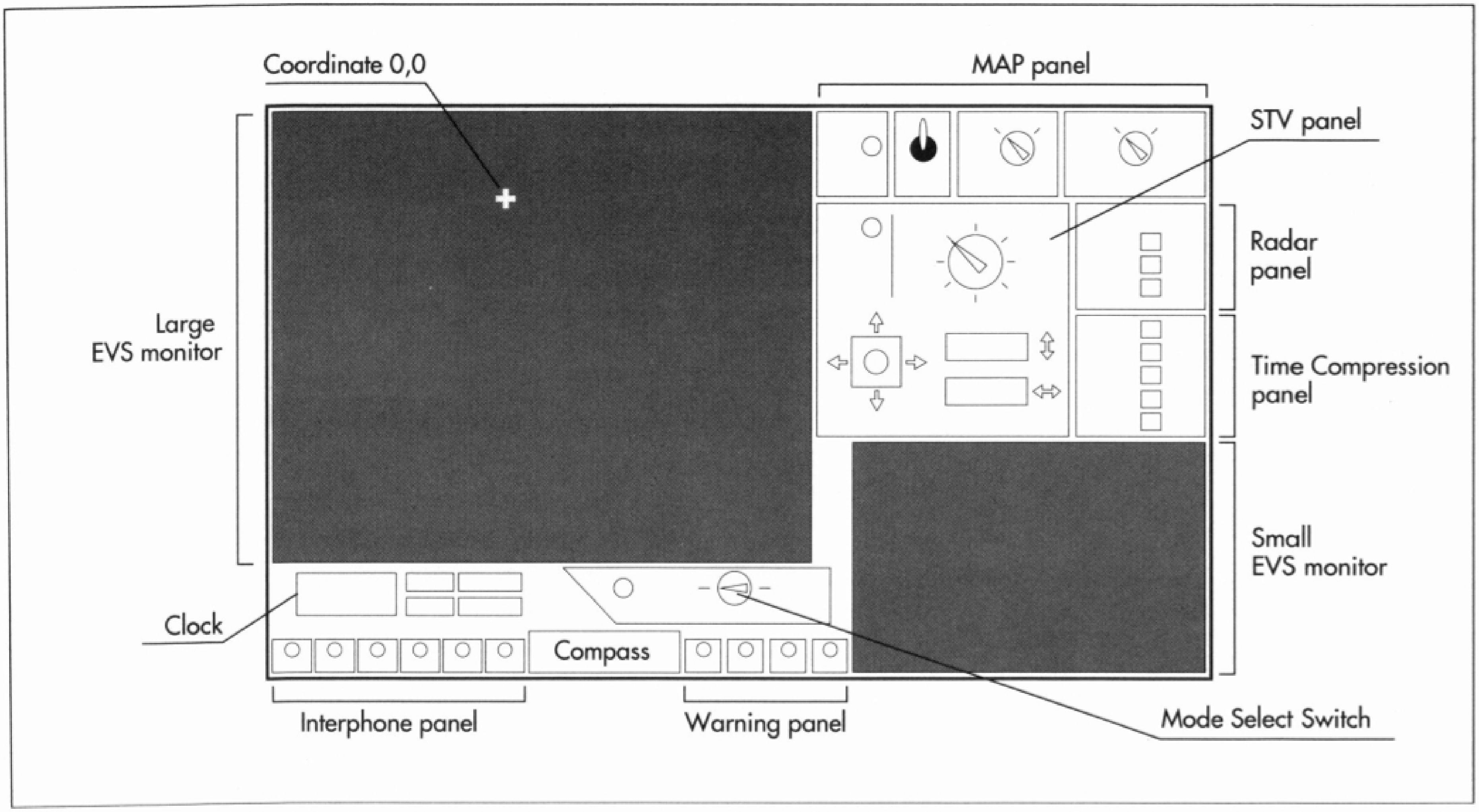
DISTANCE: 8 MILES
ETA: 0 MINS
NEXT WAYPOINT: 2

The Navigator must work continuously to insure successful completion of the mission. His duties include:

1) Complete route planning and plotting.
2) Waypoint and temporary waypoint navigation.
3) Preplanning of ordnance delivery action points and activity areas.
4) Active flight direction during low-level combat maneuvering.

Monitors

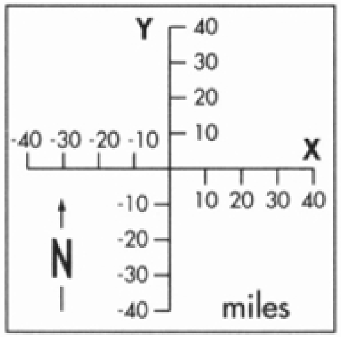
The navigator's station has two EVS monitors—one large and one small—and operates in five modes: MAP, NAV, RADAR, TER, and STV. The aircraft's current altitude and speed are always displayed at the top of the navigator's large monitor.


Coordinate 0,0
MAP panel
STV panel
Large EVS monitor
Radar panel
Time Compression panel
Small EVS monitor
Clock
Compass
Interphone panel
Warning panel
Mode Select Switch

Coordinate System

Locations on the EB-52 maps are charted according to a system of coordinates that can be used in a variety of applications, including navigation, bombing runs, escape, and evasion. Whenever reference is made in this manual to a location's coordinates, this is the system being used.

The coordinate system follows a basic 2-axis structure. The X-axis runs horizontally (east-west), and the Y-axis runs vertically (north-south). Each map is permanently marked with a small white cross, representing the point at which the two axes intersect, or "coordinate 0,0." (The location of 0,0 varies from map to map.)


Y
40
30
20
10
X
-40 -30 -20 -10
10 20 30 40
-10
-20
-30
-40
N
miles

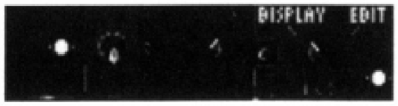
The X- and Y-axes cross at map coordinate 0,0.

- Positive Y-numbers represent miles north of coordinate 0,0.
- Negative Y-numbers represent miles south of coordinate 0,0.
- Positive X-numbers represent miles east of coordinate 0,0.
- Negative X-numbers represent miles westof coordinate 0,0.
- Coordinates are always given in the form X,Y.

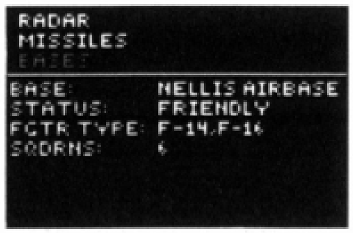
For example, on the Nevada map the city of Las Vegas has the coordinates +2,-139. This means that Las Vegas is 2 miles east and 139 miles south of coordinate 0,0.

MAP Panel

The MAP mode provides information about civilian and military features of the territory where the mission takes place, and allows editing of the mission flight plan.



1) Map mode is entered by selecting any item in the MAP panel in the upper right corner of the screen, or by changing the Mode Select switch to MAP.
2) The CIV/MIL switch toggles the large display between maps of civilian and military locations.
3) When the OFF/ON WAYPOINT switch is OFF, the CIV/MIL switch toggles the small monitor between databases of information about the civilian and military locations shown on the large display.



```
RADAR
MISSILES
BASES
BASE:       NELLIS AIRBASE
STATUS:     FRIENDLY
FGTR TYPE:  F-14,F-16
SQDRNS:     6
```

A) Databases displayed in the small monitor relate to the location currently selected in the large monitor.

B) When CIV is selected, the database provides political, population, and transportation information about selected locations on the map. Selecting BORDERS highlights the word and prints information about the currently selected border; selecting CITIES highlights the word and prints information about the currently selected city; selecting HIGHWAYS highlights the word and prints information about the currently selected road.

C) When MIL is selected, the database provides information on military installations, including radar and missile sites and airbase. Selecting RADAR highlights the word and prints information about the currently selected radar station; selecting MISSILES highlights the word and prints information about the currently selected missile installation; selecting BASES highlights the word and prints information about the currently selected airbase.

Click the right mouse button to cycle through the currently highlighted list (Borders, Cities, Roads, Radar, Missiles, or Bases) in the small monitor (the OFF/ON WAYPOINT switch must be off). Highlight a new feature type by clicking on it in the small monitor with the left mouse button.

CAUTION

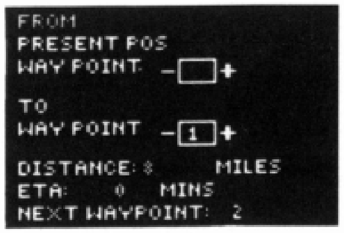
The database only presents information available to friendly intelligence sources. Undocumented installations and threats are likely to appear during missions.

4) The OFF/ON WAYPOINT switch displays the flightplan currently programmed into the aircraft's Flight Control System (FCS). The large monitor shows the waypoints and flight plan graphically on the map. The small monitor is used to compute distances, ETA, and fuel requirements between waypoints, and to relocate waypoints if desired.

A) When the OFF/ON WAYPOINT switch is ON, FCS flightplan information is available in either DISPLAY or EDIT mode.

5) The DISPLAY/EDIT FCS switch toggles the FCS between DISPLAY and EDIT modes.

B) When the DISPLAY/EDIT FCS switch is set to DISPLAY and the WAYPOINT switch is ON:

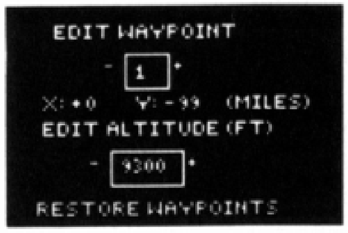


```
FROM
PRESENT POS
WAY POINT  -[ ]+

TO
WAY POINT  -[1]+

DISTANCE: 0      MILES
ETA:     0   MINS
NEXT WAYPOINT:  2
```

i) The flight plan cannot be altered.

ii) Distance and ETA from the aircraft's present position to any waypoint, or from any waypoint to another can be computed in the small monitor by changing the waypoint number in the "TO" box, and either selecting PRESENT POSITION or changing the waypoint number in the FROM box.

C) When the DISPLAY/EDIT FCS switch is set to EDIT and the WAYPOINT switch is ON:



```
  EDIT WAYPOINT
      -[1]+
 X: +0    Y: -99  (MILES)
 EDIT ALTITUDE (FT)
     -[9300]+

RESTORE WAYPOINTS
```

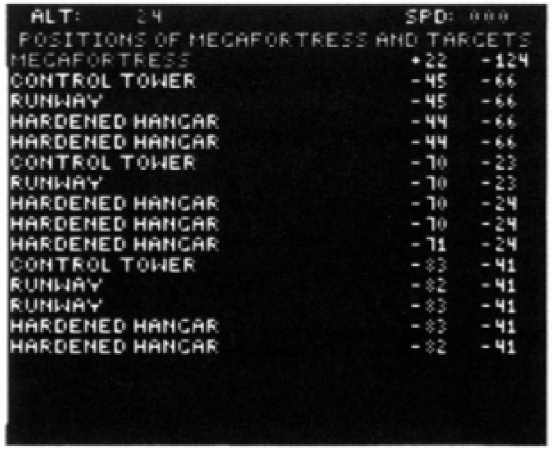
i) Flight plan waypoints can be reset by selecting and dragging them on the large monitor. (Keyboard-only users: please consult the separate "Installation & Reference" guide accompanying this manual to learn how to edit waypoints.)

ii) The coordinates of the currently selected waypoint are displayed between the EDIT WAYPOINT and EDIT ALTITUDE boxes. These coordinates change as the waypoint is moved on the large monitor.

iii) Waypoint altitudes can be adjusted in the small monitor by adding to or subtracting from the selected waypoint's assigned altitude in the EDIT ALTITUDE box.

iv) The original waypoint positions can be restored by selecting RESTORE WAYPOINTS.

NAV Mode



```
  ALT:     24                         SPD: 000
 POSITIONS OF MEGAFORTRESS AND TARGETS
MEGAFORTRESS                       +22   -124
CONTROL TOWER                      -45   -66
RUNWAY                             -45   -66
HARDENED HANGAR                    -44   -66
HARDENED HANGAR                    -44   -66
CONTROL TOWER                      -70   -23
RUNWAY                             -70   -23
HARDENED HANGAR                    -70   -24
HARDENED HANGAR                    -70   -24
HARDENED HANGAR                    -71   -24
CONTROL TOWER                      -83   -41
RUNWAY                             -82   -41
RUNWAY                             -83   -41
HARDENED HANGAR                    -83   -41
HARDENED HANGAR                    -82   -41
```

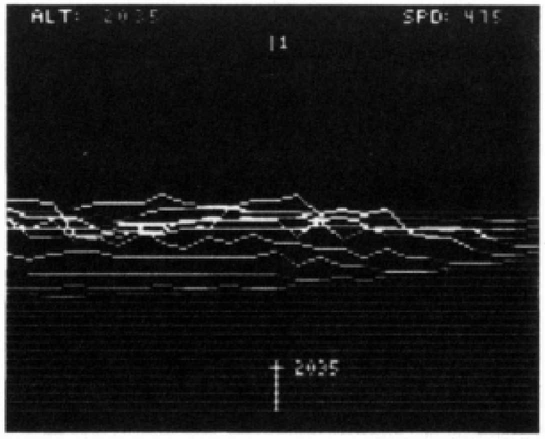
When the Mode Select switch is set to NAV, the large monitor displays a list showing the coordinate locations of both of the EB-52 and its targets for the current mission.

RADAR Panel

The RADAR mode displays a high-resolution radar image of the landscape ahead of the aircraft in the large monitor, and slaves the small monitor to the pilot's EVS display in RANGE mode.

1) Radar mode is entered by selecting the 10, 20, or 40 mile range button in the RADAR panel in the upper right corner of the screen, or by changing the Mode Select switch to RADAR.

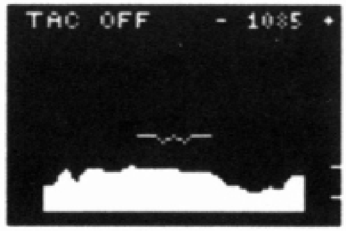
2) Current altitude is displayed at the base of the large monitor along with a cross-shaped marker representing the aircraft.



3) The direction of the next waypoint is identified by a single vertical white hashmark at the top of the large monitor, alongside the number of the waypoint. When the waypoint comes within range of the radar the symbol changes to a cross-shaped marker representing the waypoint, with the waypoint's programmed altitude displayed alongside.

4) If the AP (autopilot) light is selected in the warning panel, temporary waypoints can be set by selecting a point representing the desired new direction in the large monitor.
    A) Altitude for the temporary waypoint can be adjusted by holding down the mouse button as the selection is made and moving the mouse up and down.
    B) When the selection is made, a single green vertical hashmark appears on the screen with the new altitude alongside, and the FCS steers the aircraft toward the temporary waypoint.
    C) When the waypoint is reached, the FCS steers the aircraft back onto its programmed flightplan toward the next waypoint.

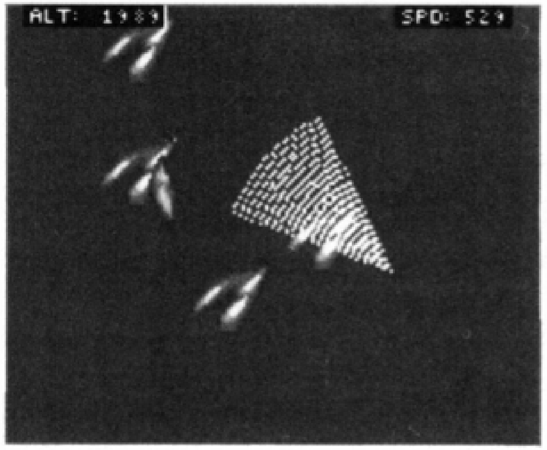
5) In RADAR mode, the radar display in the small monitor operation is identical to pilot EVS in RANGE mode.



    A) The TAC can be adjusted and turned on or off in the small monitor. Please see "Pilot Station," above, for a description of the TAC.

TER Mode

Enter TER mode with the Mode Select switch. The large monitor displays a white, fan-shaped graphic representation of the radar scanning pattern ahead of the aircraft.



1) The scale of the scanned area represented increases as the range currently set in the RADAR panel—10, 20, or 40 miles—is increased.

STV Panel

The STV mode displays an image generated by the aircraft's AN/ASQ-151 steerable low-light level television (STV) unit The STV provides a visual presentation of the area ahead of the aircraft for low-level penetration during both day and night missions.

1) STV mode is entered by selecting any item in the STV panel to the right of the large monitor, or by changing the Mode Select switch to STV.
2) Brightness of the image is adjusted by switching the BRIGHT selector knob.
3) Azimuth and elevation of the view is controlled with the 4-way ADJUST switch. When both digital POSITION displays in the STV panel read zero, the STV is oriented dead-ahead (this can be accomplished quickly by tapping "Z" on the keyboard).

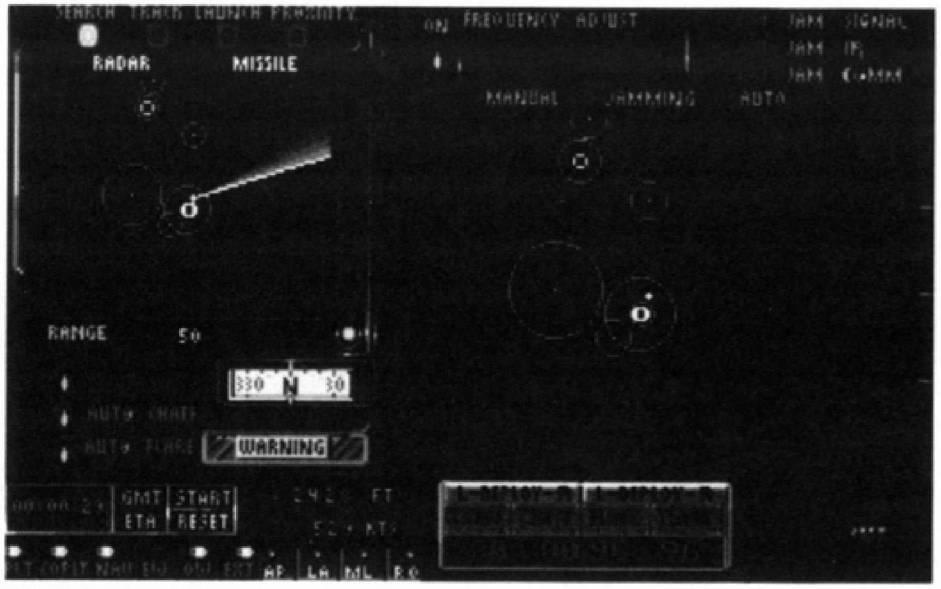
TIME Compression Panel

Time warp is activated by selecting any of the compression-factor buttons in the TIME panel above the right-hand corner of the small monitor, or by tapping keys 1-5. Each level of compression accelerates the speed of events at the factor selected. For example, selecting a compression factor of 5 makes *all* mission events occur at five times the normal rate of speed.

1) Time compression will deactivate automatically if any external event (such as an attack) occurs, or if any internal emergency causes the interphone or warning panel to flash.

ELECTRONIC WARFARE STATION

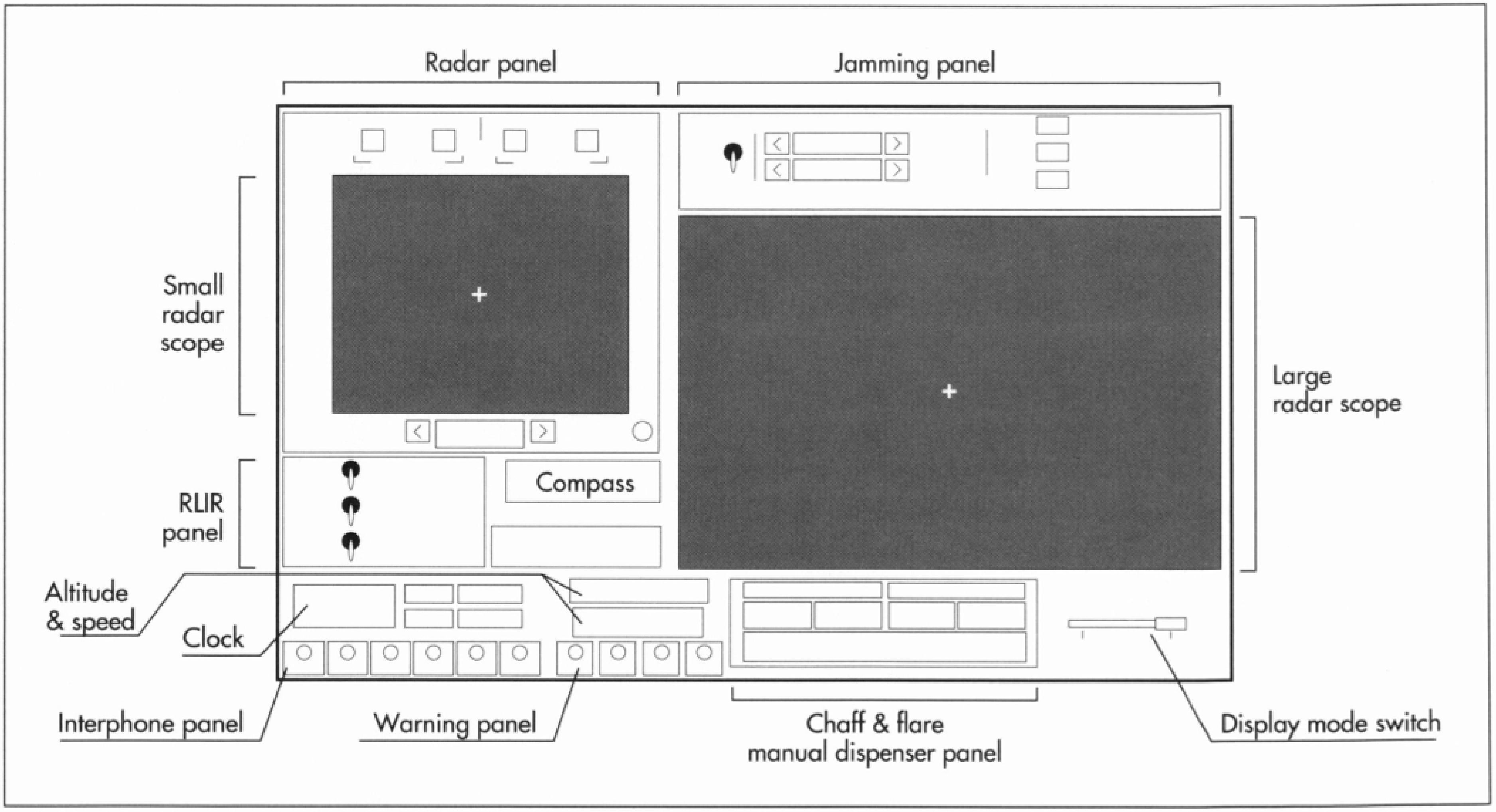
The primary responsibility of the EW officer is the utilization of the aircraft's advanced AN/ALQ-172 and AN/ALQ-12 defensive systems to provide an active defense for the aircraft. He maintains a constant radar search for enemy aircraft and ground-based threats, employing electronic countermeasures, chaff, and flares to the optimum extent in defending the aircraft against ground-based or airborne electronic devices that pose a threat to the safety of the aircraft and the completion of its mission.



RADAR Panel

The EW radar panel includes a small radar scope, four warning lights, and two range selector buttons bracketing a digital readout.

1) The SEARCH warning light illuminates when the aircraft senses an enemy radar searching for possible intruders—such as the EB-52.
2) The TRACK warning light illuminates when an enemy radar is tracking the EB-52 and is trying to lock on.
3) The LAUNCH warning light illuminates when an enemy radar has a lock on the EB-52 or launches a missile.
4) The PROXMTY warning light illuminates when a missile is within immediate striking distance of the aircraft.
5) The two RANGE buttons and digital readout below the radar scope are used to set the range at which the AN/ALQ-172 searches.
6) The small scope is the primary display for information generated by the AN/ALQ-172. The AN/ALQ-172 includes a passive radar detection system that identifies specific radar-emitting objects individually and displays them on the scope


Radar panel
Jamming panel
Small radar scope
RLIR panel
Compass
Large radar scope
Altitude & speed
Clock
Interphone panel
Warning panel
Chaff & flare manual dispenser panel
Display mode switch

(please see "Stealth Modifications: Passive & Active Radar," Chapter 4, for a general explanation of the two types of radar used in the EB-52).

A) The small cross in the center of the radar scope marks the location of the EB-52 Megafortress. Quadrants above, to the left and right of, and below the center cross represent the areas in front of, to the left and right of, and behind the aircraft.

B) Selecting any object on the radar scope highlights it and prints a text identification of it, along with its range from the EB-52 Megafortress.

i) Circle represents a search radar.

ii) Diamond represents a SAM radar.

iii) Inverted-V (or "batwing") represents an airborne enemy fighter radar.

iv) "A" represents anti-aircraft artillery.

v) Dot represents anything else, including buildings, control towers, unidentified radar sources, etc.

vi) Green circle surrounding a radar-emitting object represents the radar's range.

C) Four other monitors throughout the aircraft are slaved to the EW passive radar unless the OW station "attack" radar is operating:

i) Large radar scope at this (EW) station, when operating in the RADAR DISPLAY MODE.

ii) Pilot's EVS monitor, when operating in RDR mode.

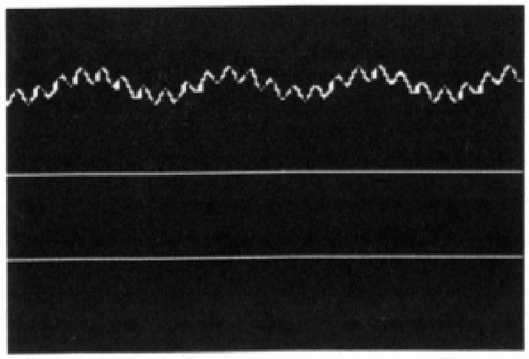
iii) Copilot's EVS monitor, when operating in RDR mode.

iv) OW station EVS monitor, when operating in SCAN mode.

Large Radar Scope

The large scope operates either in SIGNAL or RADAR display mode.

1) Turn SIGNAL mode on by switching the DISPLAY MODE switch to SIGNAL.



A) SIGNAL mode displays three signal lines on the large scope:

i) The top line represents the signal being generated by the radar-emitting object currently selected in the small radar scope, or by the closest radar-emitting source. (An object can be selected by clicking directly on it in the small monitor.)

ii) The middle line represents the signal being generated by the infrared-seeking object currently selected in the small radar scope.

iii) The bottom line represents any general communication (radio) signals detected by the radar. These include radio communications between enemy stations, and between the EB-52 and friendly stations.

2) Turn RADAR mode on by switching the DISPLAY MODE switch to RADAR.

A) The large CRT is slaved to the EW's small radar scope when the DISPLY switch is set to RADAR.

JAMMING Panel

The JAMMING panel allows automatic and manual jamming of radar signals, and automatic jamming of infrared and general communications signals.

1) To jam a radar signal in AUTO mode:

A) Select the target radar source in the small radar scope.

B) Select and hold the JAM SIGNAL button in the JAMMING panel until the TOP signal flattens into a straight line.

2) To jam a radar signal in MANUAL mode:

A) Set the DISPLAY MODE switch at the bottom right corner of the station display to SIGNAL.

B) Select the target radar source in the small radar scope.

C) Adjust the two frequency readouts until the TOP line in the large scope flattens into a straight line.

3) To jam an infrared signal:

A) Select the target infrared source in the small radar scope.

B) Select the JAM IR button in the JAMMING panel until the MIDDLE signal flattens into a straight line.

4) To jam general communications (radio) signals:

   A) Select the JAM COMM button in the JAMMING panel.

CAUTION

The radar jammer emits electromagnetic radiation, and the IR jammer emits laser radiation. Both are easily detected by the enemy. Use them carefully to avoid revealing the location of the EB-52. Please see "Strategy & Tactics: Defensive Tactics," Chapter 3.

RLIR Panel

The RLIR Panel controls the signals and automatic countermeasures programs generated by the aircraft's AN/AAQ-12 Rear Looking Infrared (RLIR) system. The RLIR locates and identifies any IR-producing threat approaching from the rear quadrant of the aircraft. Its range is 30 miles.

1) Turn the RLIR switch ON to operate RLIR in search mode.
2) WARNING light flashes when RLIR detects a heat-generating threat approaching the aircraft from the rear quadrant.
3) Turn AUTO CHAFF switch ON to turn on RLIR and program the AN/ALQ-12 to deploy chaff bundles automatically when a radar-seeking missile is detected in the rear quadrant.
4) Turn AUTO FLARE switch ON to turn on RLIR and program AN/ALQ-12 computer to deploy flare bundles automatically when an infrared-seeking missile is detected in the rear quadrant.

CHAFF/FLARE Manual Dispenser panel

Four Lundy AN/ALE-24 chaff dispensing systems are located in each wing of the EB-52, with each dispenser holding 40 chaff packages. 6 AN/ALE-20 Dynalectron-designed flare ejectors are located on each side of the aft fuselage of the EB-52, with each ejector holding 16 AN/ALA-17 flares.

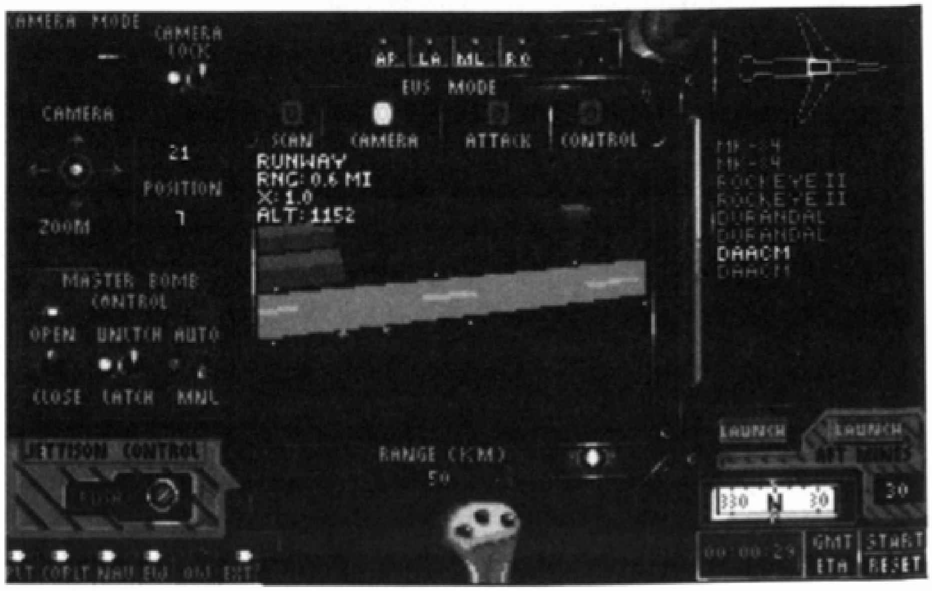
1) Select L-CHAFF or R-CHAFF to manually dispense chaff packages from the left or right wings of the aircraft.
2) Select L-FLARE or R-FLARE to manually dispense flares from the left or aft fuselage of the aircraft.

The number of chaff bundles and flares remaining is indicated below the CHAFF and FLARE buttons.

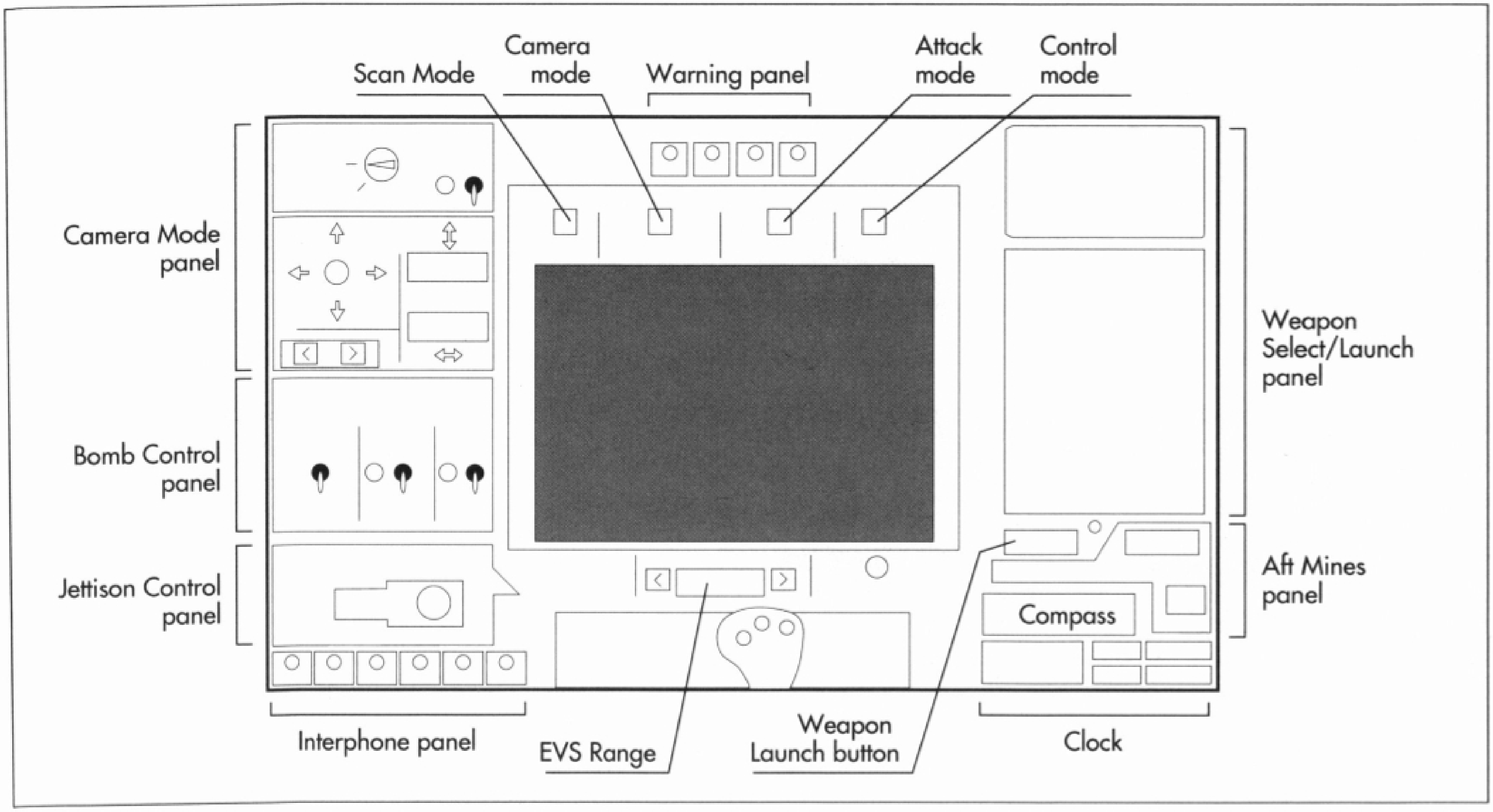
OFFENSIVE WEAPONS STATION

The OW Officer is responsible for using the fire control system to deliver air-to-ground ordnance and defend the aircraft against enemy fighters.

The heart of the OW station fire control system is the AN/APQ-166 Offensive Avionics System (OAS). Its computers have been modified in the EB-52 to interface with the FCS, the EW station's AN/ALQ-172, the AN/ASQ-151 STV, the aircraft's radar altimeter, and electrical, bleed air, and body hydraulic systems.


CAMERA MODE
CAMERA LOCK
CAMERA
21
POSITION
ZOOM
1
MASTER BOMB CONTROL
OPEN
UNLTCH
AUTO
CLOSE
LATCH
MNL
JETTISON CONTROL
AP
LA
ML
RO
EVS MODE
SCAN
CAMERA
ATTACK
CONTROL
RANGE (KM)
50
MK-84
MK-84
ROCKEYE II
ROCKEYE II
DURANDAL
DURANDAL
DAACM
DAACM
LAUNCH
LAUNCH
330
N
30
30
00:00:29
GMT
ETA
START
RESET
PLT
COPLT
NAV
EW
OW
EXT

```
RUNWAY
RNG: 0.6 MI
X: 1.0
ALT: 1152
```


Camera mode
Scan Mode
Warning panel
Attack mode
Control mode
Camera Mode panel
Bomb Control panel
Jettison Control panel
Weapon Select/Launch panel
Aft Mines panel
Compass
Interphone panel
EVS Range
Weapon Launch button
Clock

EVS

The OW EVS operates in four modes.

1) SCAN uses the aircraft's passive radar to scan for radar-emitting sources. Refer to the EW Station description for details on the operation of this mode (please see also "Stealth Modifications," Chapter 4, for an explanation of passive and active radar).

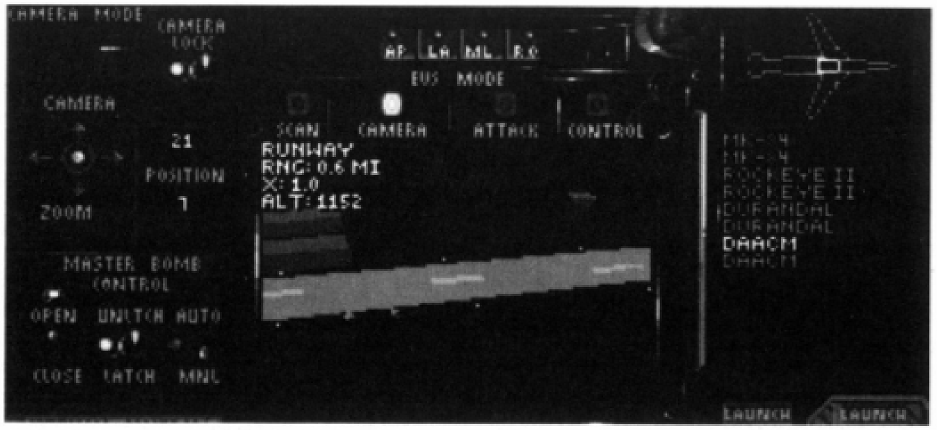
2) CAMERA uses the EVS as a viewing screen for TV images controlled by the CAMERA MODE Panel (see CAMERA MODE Panel, this section).

3) ATTACK activates the aircraft's active search radar and displays it on all radar screens in the aircraft (pilot, copilot, EW, and OW). (Please see "Stealth Modifications," Chapter 4, for an explanation of passive and active radar.)

   A) The ATTACK active search radar signal is highly detectable by enemy radar stations.

   B) When the ATTACK radar is on, the "RO" warning light illuminates at all stations.

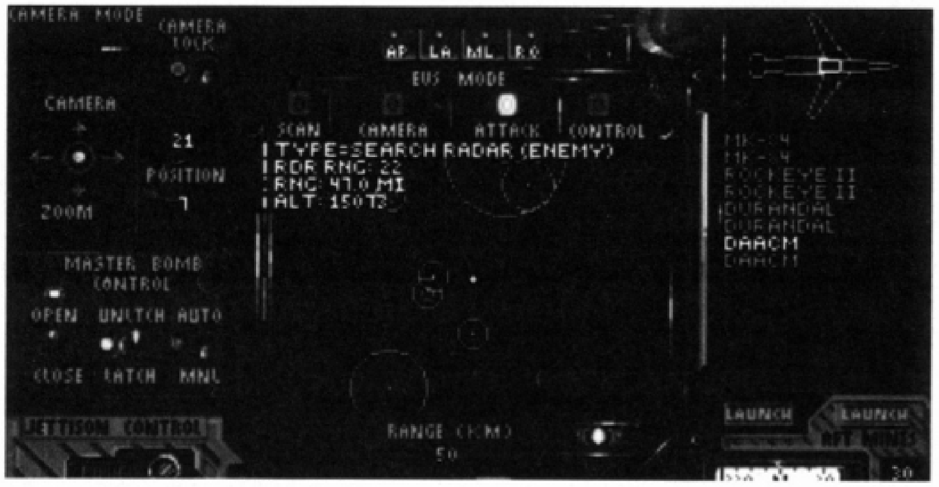
   C) The ATTACK radar returns signals from any imageable source (except terrain) within the range set in the RANGE readout at the bottom of the EVS.


CAMERA MODE
CAMERA LOCK
CAMERA
21
POSITION
ZOOM
1
MASTER BOMB CONTROL
OPEN
UNLTCH
AUTO
CLOSE
LATCH
MNL
AP
LA
ML
RO
EVS MODE
SCAN
CAMERA
ATTACK
CONTROL
LAUNCH
LAUNCH

RUNWAY
RNG: 0.6 MI
X: 1.0
ALT: 1152

DAACM

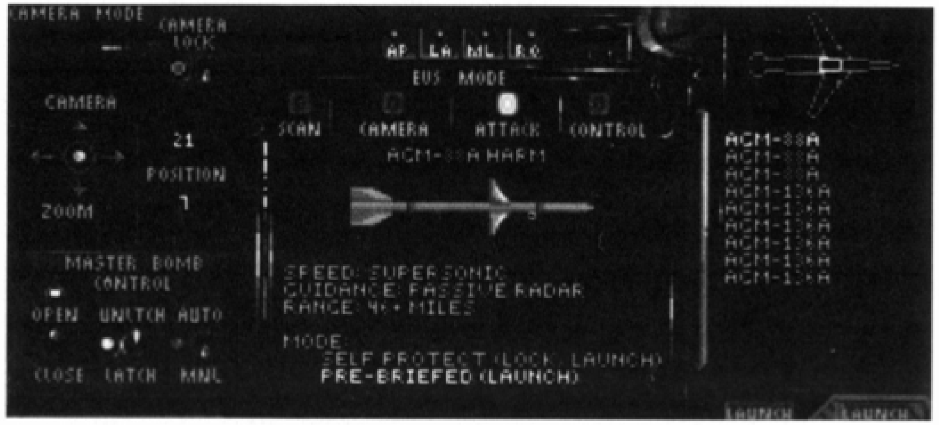
OW EVS in CAMERA mode.


CAMERA MODE
CAMERA LOCK
CAMERA
21
POSITION
ZOOM
1
MASTER BOMB CONTROL
OPEN
UNLTCH
AUTO
CLOSE
LATCH
MNL
JETTISON CONTROL
AP
LA
ML
RO
EVS MODE
SCAN
CAMERA
ATTACK
CONTROL
RANGE (KM)
50
LAUNCH
LAUNCH

TYPE=SEARCH RADAR (ENEMY)
RDR RNG: 22
RNG: 47.0 MI
ALT: 150T3

DAACM

OW EVS in ATTACK mode.


CAMERA MODE
CAMERA LOCK
CAMERA
21
POSITION
ZOOM
1
MASTER BOMB CONTROL
OPEN
UNLTCH
AUTO
CLOSE
LATCH
MNL
AP
LA
ML
RO
EVS MODE
SCAN
CAMERA
ATTACK
CONTROL
LAUNCH
LAUNCH

AGM-88A HARM

SPEED: SUPERSONIC
GUIDANCE: PASSIVE RADAR
RANGE: 4+ MILES
MODE:
SELF PROTECT (LOCK LAUNCH)
PRE-BRIEFED (LAUNCH)

AGM-88A
AGM-88A
AGM-88A
AGM-136A
AGM-136A
AGM-136A
AGM-136A
AGM-136A
AGM-136A

OW EVS in CONTROL mode.

4) Select CONTROL to view a description of the weapon currently selected in the WEAPON SELECT/LAUNCH panel.

   A) Some weapons can be armed in different modes by clicking directly on the mode names while the EVS is in CONTROL mode. (Please also see "Ordnance," Chapter 5, for descriptions each weapon.)

CAMERA MODE Panel

The CAMERA panel controls the various cameras that send TV images to the EVS.

1) The CAMERA button above the EVS must be selected for the CAMERA MODE panel controls to work.

2) Turn the CAMERA mode selector switch to STV to show the picture currently being generated by the AN/ASQ-151 STV system.

   A) Azimuth and elevation of the view is controlled with the 4-way CAMERA switch. When both digital displays to the right of the read zero, the STV is oriented dead-ahead. (This can be accomplished quickly by tapping "Z" on the keyboard.)

   B) Select the ZOOM increase/decrease buttons to zoom in or out with the STV.

   C) The camera in STV mode is used to target ordnance (please see "Weapon Select/Launch Panel," below, and "Ordnance," Chapter 5), and for general observation.

3) Turn the CAMERA mode selector switch to GUIDANCE to see the missile camera view.

   A) A TV-guided weapon—such as the AGM-142— must be selected for the GUIDANCE mode to operate. with any other type of weapon selected, the camera in GUIDANCE mode will display only static. (Please see

"Weapon Select/Launch Panel," below, and "Ordnance," Chapter 5.)

MASTER BOMB CONTROL Panel

The aircraft bomb bay doors operate as a single unit and can be opened and closed manually or automatically. While open, the aircraft's speed is reduced and RCS (please see "Stealth Modifications," Chapter 4) is increased.

1) Set the AUTO/MNL switch to MNL to operate the doors manually.
    - A) When the bomb bay doors are operated manually, the correct sequence must be observed in order to release ordnance effectively and minimize RCS.
        - i) Select and prepare ordnance (see WEAPON SELECT/LAUNCH Panel section)
        - ii) Set UNLTCH/LATCH switch to UNLTCH.
        - iii) Set OPEN /CLOSE switch to OPEN. The doors take 5 seconds to open, at which point the OPEN indicator light illuminates. Note also that the DRS light on the Pilot's eyebrow panel illuminates while the doors are open.
        - iv) Launch weapon(s).
        - v) Set OPEN/CLOSE switch to CLOSE. The doors take 5 seconds to close, at which point the OPEN indicator light goes off. Note also that the DRS light on the Pilot's eyebrow panel goes off when the doors close.
        - vi) Set UNLTCH/LATCH switch to LATCH.
2) Set the AUTO/MNL switch to AUTO to operate the doors automatically.
    - A) Select and prepare ordnance (see "WEAPON SELECT/LAUNCH Panel" below).
    - B) Press LAUNCH button.
        - i) The UNLTCH light comes on
        - ii) The OPEN light illuminates after five seconds.
        - iii) Weapon(s) launch.
        - iv) The doors close automatically.
        - v) The doors are latched automatically.

WEAPON SELECT/LAUNCH Panel

The WEAPON SELECT/LAUNCH panel includes a diagram of the EB-52's four main weapon loading areas, a listing of weapons currently loaded into the currently selected weapon loading area, and a LAUNCH button. Three steps must be completed in order to successfully strike a target: lock onto a target, select a weapon, and launch. Some weapons require piloting through TV guidance after launch in order to strike their targets.

Lock Onto Target

Select a target using the SCAN, ATTACK, or CAMERA mode of the EVS. The fire control computer will attempt to lock onto any object selected in the EVS in any of these modes. Targets that do not generate a heat or radar signature—such as runways, bridges, and hardened shelters—must be targeted using the CAMERA mode.

CAUTION

The lock must be maintained for the weapon to locate its target. If the lock is lost, it must be reestablished before the weapon is launched.

Select Weapon

1) Select the pylon or bomb bay containing the weapon to be launched from the EB-52 diagram.
2) Select the weapon to be launched from the list below the diagram.
   A) Weapons in red are not appropriate for the currently selected target.
   B) Weapons in dark green are appropriate for the current target. ("Appropriate" means only that it is *theoretically* possible to hit the selected target with this weapon. Ordinary iron bombs—such as the MK-84—are always "appropriate" in theory, even though the likelihood of hitting a target such as a MiG with one is highly questionable.)
   C) Weapon in bright green is the currently selected weapon.
   D) Weapons in gray have been used.
3) Make any arming-mode changes necessary using the CONTROL mode of the EVS. If the ordnance is a free-fall weapon, note the recommended STV vertical coordinate listed with the weapon information in CONTROL mode (the horizontal coordinate is always 0 (zero)). (Please also see the targeting information for each weapon in Chapter 5, "Ordnance.")
4) If the weapon is stored in one of the bomb bays, make sure the bomb bay doors are opened correctly during the launch sequence, either through manual or automatic operation (refer to "MASTER BOMB CONTROL Panel," above).
5) Use the "\" (backslash) key to make the computer choose the next appropriate weapon.

Launch Weapon

Before launching a weapon, make sure that the target is within the selected weapon's range, as specified in the CONTROL mode EVS, or in Chapter 5, "Ordnance."

Radar- and infrared-guided missiles (AIM-9R, AIM-120C, AGM-65G, AGM-136A, AGM-88A, AGM-84A, AGM-84E):

1) Select LAUNCH.
2) If not operating in AUTO mode and weapon was stored in bomb bay, close bomb bay doors.

TV-guided missiles (AGM-130, AGM-142):

1) Select LAUNCH.
2) Switch CAMERA MODE from STV to GUIDANCE.
3) After the missile is launched, use the EVS as the missile's "EYE" to pilot the weapon to its target, flying the weapon to its target by clicking on the camera direction arrows (use of the autopilot or TAC during this time is highly recommended).
4) If not operating in AUTO mode and weapon was stored in bomb bay, close bomb bay doors.

Laser-guided glide bomb (Rockeye II):

1) With the target selected in CAMERA mode, steer the aircraft so that the horizontal POSITION coordinate in the CAMERA panel reaches zero (0). This means that the aircraft is on course directly toward the target.
2) Select LAUNCH. When the vertical coordinate reaches 12, the weapon's laser guidance system will launch the weapon automatically.
3) If not operating in AUTO mode and weapon was stored in bomb bay, close bomb bay doors.

Free-fall ordnance (Durandal, DAACM, MK-84):

CAUTION

To protect the aircraft from ground-blast, free-fall ordnance should not be released below 500 ft.

1) With the target selected in CAMERA mode, steer the aircraft so that the horizontal POSITION coordinate in the CAMERA panel reaches zero (0). This means that the aircraft is on course directly toward the target.
2) Adjust the aircraft's altitude in accordance with the weapon's delivery requirements. (Any altitude above 1000 ft for the MK-84; 500 to 1000 ft for the Durandal and DAACM.)
2) Wait for the vertical POSITION coordinate in the CAMERA panel to reach the number recommended for the weapon in the CONTROL mode of the EVS (also listed in Chapter 5, "Ordnance").
3) Select LAUNCH.
4) If not operating in AUTO mode and weapon was stored in bomb bay, close bomb bay doors.

AFT MINES Control Panel

The tail of the EB-52 is equipped with an enclosed cannon that fires 12-inch flak canister rockets. These are used to attack enemy fighters approaching from the rear quarter (please see Chapter 5, "Ordnance"). Through its interface with the AN/ALQ-153 aft fire-control radar, the AN/APQ-166 tracks both rocket and enemy fighter and transmits steering signals to the rockets. When the distance between the fighter and the rocket decreases to less than 200 yards, the fire-control computer detonates the rocket. Maximum range is two miles.

1) Select the LAUNCH button in the AFT MINES panel to launch an air mine.

The EB-52 carries a maximum of 30 air mine rockets. The number remaining is listed in the AFT MINES control panel.

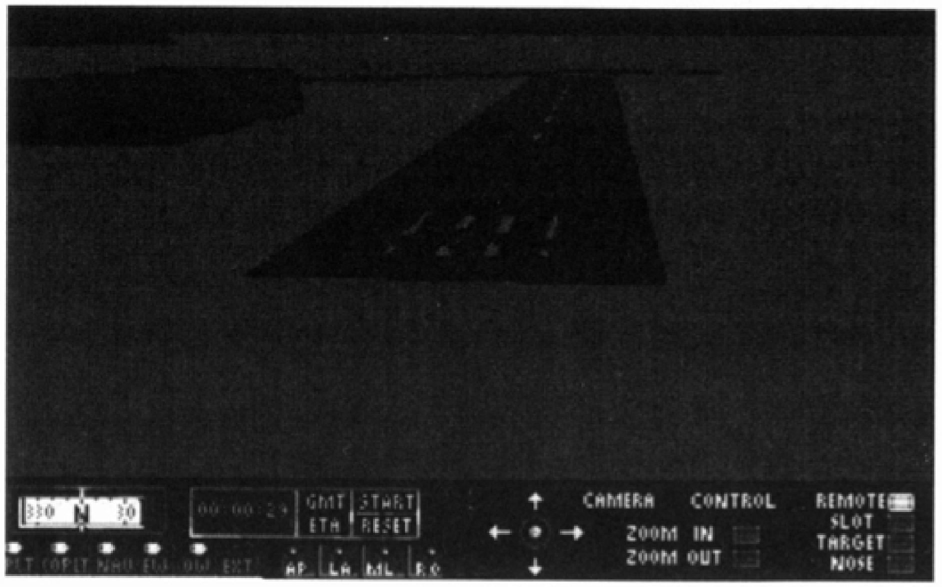
JETTISON CONTROL Panel

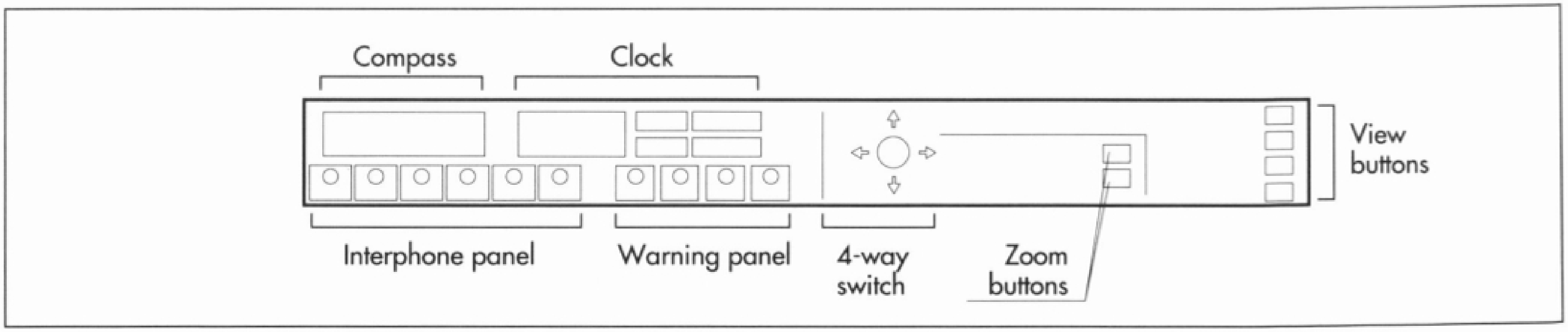
Should the aircraft be damaged yet still manage to return to home base, it is extremely unwise to continue carrying any left-over ordnance during landing approach and touchdown. At a safe distance from the airbase, excess oednance should be jettisoned.

1) Select the JETTISON button twice with a one-second interval to deactivate and jettison all ordnance.

EXTERNAL CAMERA

The external camera station displays a view of the EB-52 in the upper 3/4 of the display. The EB-52 is always in the center of the camera's view, except when the "Nose" or "Target" view buttons are selected.





In addition to the multi-station instruments, the External Camera station has the following controls:

4-Way switch

Select the 4-way switch to the external camera in 360° arcs around the aircraft both horizontally and vertically.

ZOOM IN/ZOOM OUT

Select the ZOOM IN/ZOOM OUT buttons to move the camera closer to or farther away from the aircraft.

REMOTE view button

Select the REMOTE button to allow the camera to move with complete freedom in observing the aircraft.

SLOT view button

Select the SLOT button to restrict the camera to a cone-shaped area immediately behind the aircraft. The camera can travel only 45° to either side of, or above or below the aircraft tail section.

TARGET view button

Select the TARGET button for a reverse-angle view from behind the currently selected target toward the EB-52.

NOSE view button

Select the NOSE button for a view of a cone-shaped area immediately ahead of the aircraft. In this view, the camera is mounted on the nose of the aircraft and can travel only 45° to either side of, or above or below the aircraft nose section.

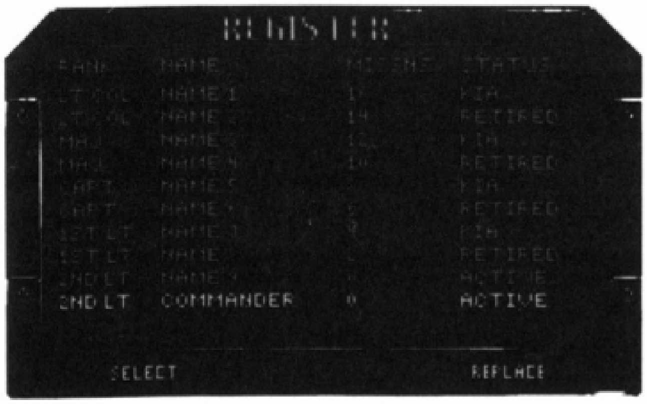
2 FLIGHT PROCEDURES

CAUTION

These procedures are for a crew inexperienced in the operation of this aircraft. This manual provides the best possible operating instructions under most circumstances, but is a poor excuse for sound judgment. Multiple emergencies, adverse weather, terrain, etc. will require modification of the procedures.

MISSION ASSIGNMENT

1) Register for a mission in one of the following ways:

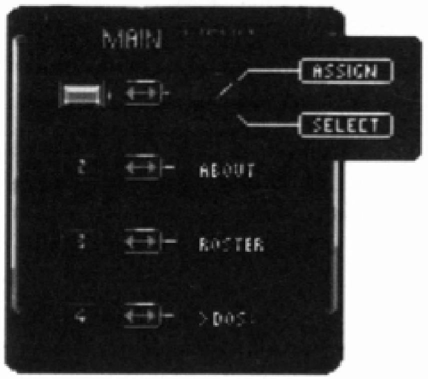


   a) Click on an active pilot in the registration panel monitor and click SELECT.

   b) Click the name of a pilot you want to replace, click REPLACE, and type in the new pilot's name. Tap the Return key to enter the new pilot's name.

2) Click MISSIONS on the Main Menu panel.

3) Click ASSIGN or SELECT on the Mission Selection pop-up menu.



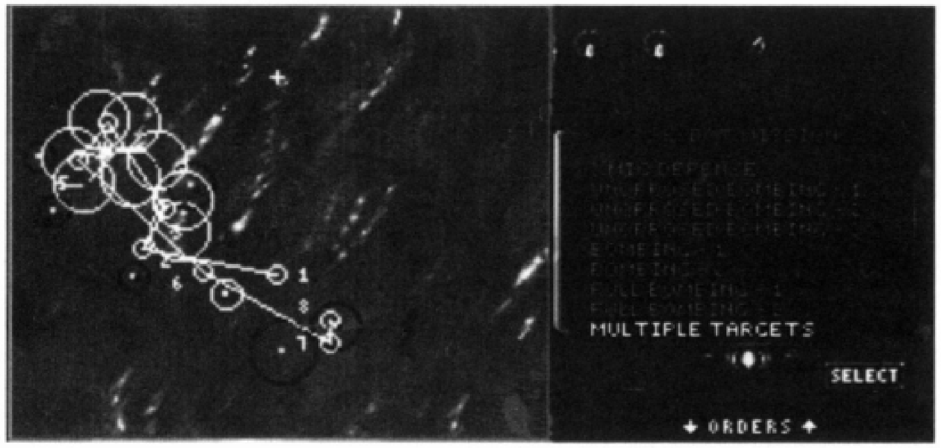
SELECT gives the crew direct control of mission selection, including theater, objectives and flight plan, and loadout.

ASSIGN presents a mission chosen for the crew by Mission Control. Accept or reject the assigned mission by clicking ACCEPT or REJECT. If a mission is rejected, a new one is assigned, and so on. Choosing ACCEPT bypasses steps 4 and 5 below and takes you directly to the Loadout screen.

4) When the Mission Select panel and monitors appear, the small monitor shows a list of three theaters of operation—Red Flag (Nevada), Persian Gulf, and Flight of the Old Dog (Kamchatka Peninsula)—while the large monitor shows a map of the currently selected region. (Note: the switches at the top of the panel will not work until a theater is selected.)

Click the geographic area in which you want to fly your mission and then click SELECT.

Mission Select Panel



Three mode switches control the Mission Select panel:

INFO/SELECT switches the small monitor between a database of information about the region and a listing of all missions available in that region.

CIV/MIL switches the monitors between displays of civilian and military features and threats in the region.

OFF/ON WAYPOINT shows you the flight plan and waypoints for the mission on the large monitor. (Waypoints cannot be changed at this point.)

CAUTION

Clicking SELECT at the bottom right corner of the Mission Select panel selects the mission currently highlighted in the small monitor, WHETHER OR NOT the INFO/SELECT switch is set to SELECT.

Click the right mouse button to cycle through the currently highlighted list (Borders, Cities, Roads, Radar, Missiles, or Bases) in the small monitor (the OFF/ON WAYPOINT switch must be off). Highlight a new feature type by clicking on it in the small monitor with the left mouse button.

NOTE

If the INFO/SELECT switch is set to INFO while the WAYPOINT switch is ON, the distance in miles between waypoints can be computed in the small monitor by changing the waypoint number in the "TO" box, and the "FROM" box if PRESENT POS is not clicked. click on the "+" or "-" signs alongside each box to increase or decrease a waypoint number.

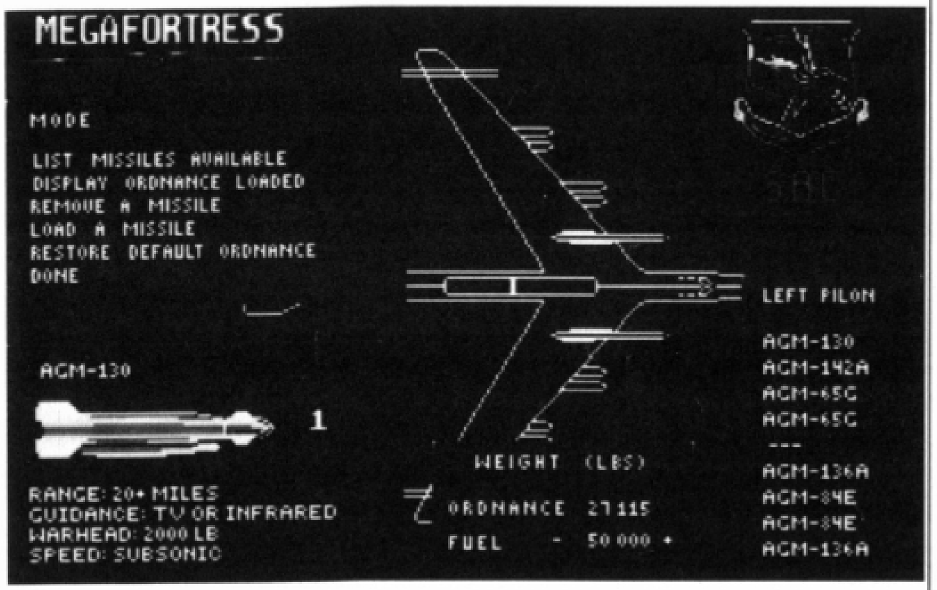
Orders for the currently selected mission are printed below the Mission Select panel and monitors; scroll through them by clicking the arrows below the small monitor. Read the mission orders carefully, then use the Mission Select panel databases and waypoint distance calculator to learn as much as possible about a mission before finally selecting it. This information will be of critical value during execution of the mission.

5) If your mission will be either in the Red Flag or Persian Gulf regions, select a mission on the scrolling list (scroll the list by clicking the up or down arrows to the right of the list) and click SELECT.

   If you select Flight of the Old Dog, take time to read about the mission in Chapter 6. Even if you decide not to do so, you may be able to complete the mission by reading Dale "Bear" Brown's novel, *Flight of the Old Dog*, the original story of this extraordinary adventure.

Loadout Screen

Take time to read "Offensive Strategy," Chapter 3, before preparing the mission loadout.



RANGE: 20+ MILES
GUIDANCE: TV OR INFRARED
WARHEAD: 2000 LB
SPEED: SUBSONIC

ORDNANCE 27115
FUEL - 50 000 +

The Loadout screen operates in four modes, and includes four panels and a pylon/bomb bay-selection diagram of the aircraft.

Weight Panel

The Weight panel always lists the weight of all ordnance currently loaded into the aircraft's two bomb bays and onto its two wing pylons, and the weight of fuel in the aircraft's four main fuel tanks. Ordnance weight is adjusted by altering the weapons loadout, and fuel weight is adjusted by clicking the "+" and "-" signs to either side of the readout. The aircraft is always preloaded with 50,000 lbs of fuel.

Total fuel and ordnance loadout for the EB-52 cannot exceed 192,000 lbs.

Mode Panel

Click on a mode to select it.

LIST MISSILES AVAILABLE changes the Ordnance panel to a listing of all available ordnance, and the Weapons Select panel to a database of information about the weapon currently selected in the Ordnance panel.

Click on the arrows in the right margin of the Ordnance panel to scroll through the weapons; click on a weapon to select it and change the information in the Weapons Select panel.

DISPLAY ORDNANCE LOADED changes the Ordnance panel to a listing of weapons loaded at the currently selected location on the pylon/bomb bay-selection diagram. The Weapons Select panel now gives information only about weapons loaded at that location, and lists the total quantity of the currently selected weapon on board the aircraft.

Click on a bomb bay or pylon in the pylon/bomb bay-selection diagram to list the weapons for that location; click on a weapon to select it and change the information in the Weapons Select panel.

REMOVE A MISSILE also changes the Ordnance panel to a listing of weapons loaded at the currently selected location on the pylon/bomb bay-selection diagram. The Weapons Select panel now has a "YES" button that is used to remove the weapon currently selected in the Ordnance panel.

Click "YES" in the Weapons Select panel to remove the currently selected weapon.

LOAD A MISSILE also changes the Ordnance panel to a listing of weapons loaded at the currently selected location on the pylon/bomb bay-selection diagram. The Weapons Select panel "YES" button is used to load the currently selected weapon.

Click on the arrows in the right margin of the Weapons Select screen to review the information about each weapon; click "YES" to load the weapon currently listed in the Weapons Select panel.

NOTE

There must be a position available at the chosen location for the new weapon to load. Depending on the size of the weapon chosen, some empty positions may not accept it. For example, the AIM-120C is too long for all nine positions on a pylon to accept it. In its case, only six positions on each pylon are available.

RESTORE DEFAULT ORDNANCE resets the ordnance and fuel loadout to their original conditions.

1) Adjust both the fuel and weapons loadouts for the mission in the Loadout screen (please also see "Fuel Management," Chapter 3, and "Ordnance," Chapter 5).

CAUTION

Missions in the Persian Gulf require at least 40,000 lbs of fuel to make it to waypoint 1—the inflight refueling rendezvous point.

Additional fuel beyond the preloaded amount must be loaded for each Red Flag mission; inflight refueling is available only *in the Inflight Refueling training mission.*

2) Click DONE on the MODE menu to accept the current loadout and begin the mission.

PROCEDURES

CAUTION

These procedures are provided for crew reference only. It is highly recommended that crews take full advantage of the Red Flag training missions to practice fundamental operational procedures before attempting either the Persian Gulf or Flight of the Old Dog missions.

NOTE

The use of keyboard "hot keys" can be extremely useful in these procedures. Please see the separate "Installation & Reference" guide accompanying this manual for a complete list of available "hot keys."

NOTE

Basic startup procedures are also available from the copilot EVS. Select the PROCEDURAL button and scroll through the screens by selecting the < and > buttons.

Preflight

Copilot Checklist

1) Batteries on.
2) Rudder/Elevator Hydraulic switches ON.
3) Landing/Taxi lights ON.
4) Nav lights ON.
5) Anti-Collision lights ON.
6) Interphone ON (default).
7) Cabin pressure 7.45 psi.

Pilot Checklist

1) Parking Brake ON (unless the aircraft must first taxi to the end of the runway).
2) Taxi/Land Ratio switch set to Land (unless the aircraft must first taxi to position).
3) Flaps extended.

Starting Engines

Pilot Checklist

(This procedure is also followed when restarting an individual engine in flight.)

1) Engines ON. (Click the individual engine lights, or click ALL, on the right side of the Pilot's instrument panel, to turn on engine switches on. The engine lights will illuminate.)
2) ENGINE START switch to C. (Click the ENGINE START switch to C to ignite the starter cartridges. The engines will start, and the PWR display will show 1%.)
3) ENGINE START switch to F. (Click the ENGINE START switch back to F to channel electrical power to the aircraft's systems during flight.)

Copilot Checklist

1) (After engine start) Battery switch OFF.

Taxi and Takeoff

Pilot Checklist

1) Increase power in all engines to 100% (15% to taxi only) by clicking "+," to the right of the PWR display.
2) Parking Brake OFF (or as speed control while taxiing).
3) At 170 knots, pull back on control column (press down-arrow key) until the artificial horizon indicator reads 6%.
4) Retract landing gear immediately after takeoff. (Gear will be damaged if extended at speeds exceeding 375 kts.)
5) RETRACT flaps when speed exceeds 200 kts. (Flaps will be damaged if extended at speeds exceeding 450 kts.)
6) Decrease power to 80%.

Flight Control

1) To turn the aircraft to the left, press the left-arrow key to raise the left wing spoiler and elevate the right rear stabilator.
2) To turn the aircraft to the right, press the right-arrow key to raise the right wing spoiler and elevate the left rear stabilator.
3) To make the aircraft climb, or pitch up, press the down-arrow key to elevate both stabilators.
4) To make the aircraft descend, or pitch down, press the up-arrow key to lower the stabilators.
5) To slow the aircraft down quickly, turn AIRBKE switch ON in flight to raise both sets of wing spoilers.
6) Extend FLAPS if airspeed drops below 200 kts.

Navigation

Please see "Multi-Station Instruments" and "Navigator Station" in Chapter 1, and "Navigation" in Chapter 4 for a complete description of the EB-52 navigation systems and controls.

IFF Identification

At some point during each mission—generally in the vicinity of the first waypoint, though it may occur near any friendly radar site—the aircraft will be contacted by ground control and identification requested via IFF (Identification Friend or Foe) Transponder .

(Please see "Copilot: Transponder," Chapter 1, and "Sensor Management," Chapter 4.)

WARNING

Failure to correctly identify the aircraft will result in the destruction of the aircraft by friendly fire.

WARNING

Turn off the transponder in enemy territory to avoid unwanted attention.

The copilot is responsible for the identification procedure. To identify:

1) Switch the Transponder switch to STBY.
2) The first two digits on the transponder are automatically adjusted to match the 2-digit code transmitted by ground control.
3) The numbers transmitted to the EB-52 correspond to one of the 2-digit page numbers in this manual. Locate that page and note the 2-digit code in parentheses to the right of the page number.
4) Enter the 2-digit code into the last two numbers of the transponder by selecting the arrows to the left of each number.
5) Switch the transponder switch from STDBY to ON.
6) Select the IDENT button. When the REPLY light flashes, identification has been correctly made.

WARNING

The transponder should remain on as long as the aircraft remains in friendly airspace, but be turned OFF before entering enemy territory. The set transmits UHF radio waves and will attract immediate attention from enemy ground installations. The UHF warning light on the pilot's screen illuminates when the transponder is on.

Inflight Refueling

1) With the Pilot EVS in RADAR mode and the autopilot ON, fly toward the first waypoint.
2) When the refueling tanker is detected by the EB-52's passive radar (the tanker appears on the monitor as a circle surrounding a large red block-letter "T"), click on the tanker symbol to select it.
3) Select the "C" light in the AIR REFUEL panel to lock onto the tanker.

When the autopilot locks onto the tanker's location, the aircraft will automatically fly toward the rendezvous.

NOTE

Refuelling tankers generally operate between 9,000 and 10,000 ft.

WARNING

A power setting of at least 85% should be maintained during closure to make sure that the EB-52 can overtake the tanker. Slower speeds may result in exhaustion of fuel supplies before rendezvous.

WARNING

Upon overtaking the tanker, the autopilot will automatically lower the engine power setting to 40% to prevent collision. After refueling, the pilot must reapply power. Reapplication of power is NOT an automatic function of the autopilot.

4) When the RDY light in the AIR REFUEL panel illuminates, click the DRS light to open the refueling slipway doors. Refueling will begin immediately.
5) When refueling is complete, separation will occur automatically and the EB-52 will resume its course toward the next waypoint.
6) Reapply power to at least 75% (see warning, above).

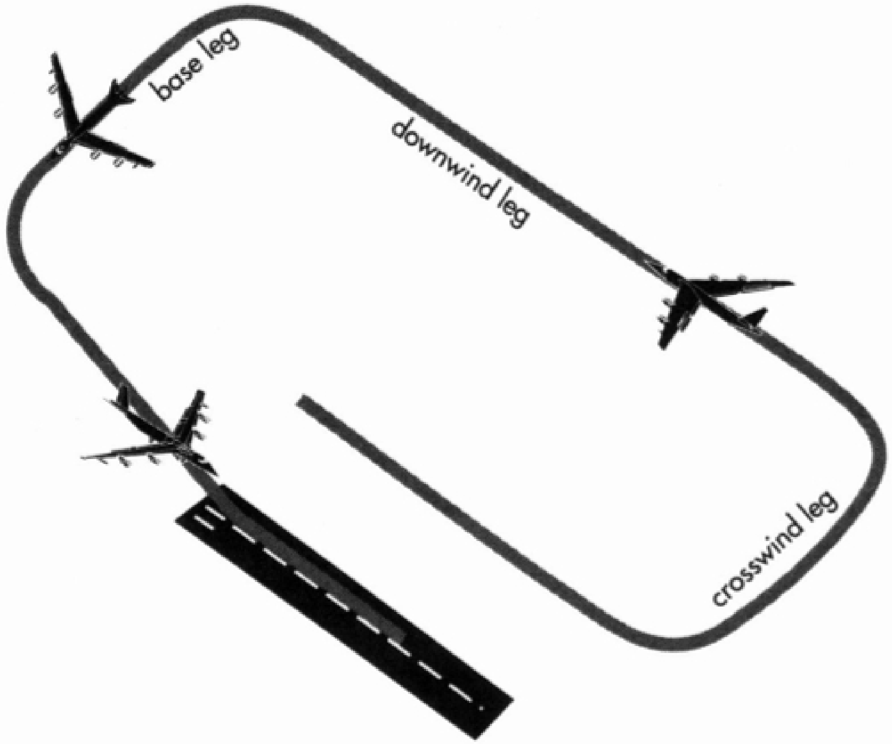
Landing Approach

NOTE

Runways for all EB-52 operations are oriented north/south, and approaches should be made from the south in a northerly direction, except under emergency conditions.

If possible, a standard military approach should be executed.

1) Heading north on the upwind leg of the landing pattern, pass directly over the airbase at an altitude of 2,000 to 5,000 ft.
2) At a distance of 1-5 miles past the runway, execute a 90° turn onto the crosswind leg.
3) Fly 2-3 miles on the crosswind leg.
4) Execute a 90° turn onto the downwind leg.
5) With a lateral distance of 2 miles between the aircraft and the runway, fly at least 3 miles to the south past the runway.
6) During the downwind leg of the pattern, cut back on throttles and use the airbrakes to decrease speed to 300 kts.
7) During the downwind leg of the pattern, descend to 1000 ft.
8) Execute a 90° turn onto the base leg of the landing pattern.
9) Fly the same distance flown on the crosswind leg.
10) Execute a 90° turn and enter the approach leg toward the runway.



Landing

During the approach leg of the landing pattern, the aircraft should be lined up with the runway at a distance of 2-5 miles, at an elevation of approximately 1000 ft. Speed should be no greater than 300 kts.

1) Using throttles and airbrakes, decrease speed to 250 kts.

2) Extend flaps.

3) Lower landing gear.

4) Switch TAXI/LAND switch to LAND.

5) With the runway in view, begin descending, slowly decreasing power and speed so that final touchdown will be accomplished at no greater than 250 kts. Use the airbrakes to reduce speed quickly.

WARNING

During landing, aircraft can have no more than 11° of pitch, or 5° of roll. To maintain these parameters, please refer to the pilot's artificial horizon indicator frequently during landing.

6) Touch down within the first third of the runway.

7) If touchdown cannot be accomplished safely in the first third of the runway, immediately apply full power, climb away from the runway, and repeat the approach and landing procedures.

8) If touchdown is succesfully accomplished, immediately select ALL, to the right of the PWR percentage display, to cut power to all engines.

9) Select PRKNG BKE to bring the aircraft to a complete stop.

Emergency Landings

It is possible to execute a no-gear belly landing in the EB-52, given the following conditions:

1) Final landing speed cannot exceed 130 kts.

2) All remaining ordnance should be jettisoned before the attempt is made (please see "OW Station," Chapter 1).

Damage Control

Damage results from incorrect operation of the aircraft or from attack by enemy/friendly fire.

In the first instance, either the aircraft is flown into an obstruction (such as the ground or a mountain), or is flown at an airspeed unsuitable for the deployment of flaps (maximum speed 450 kts) or landing gear (maximum speed 375 kts). In either case, the crew is strongly directed to spend a few extra moments in the early sections of this chapter, "Flight Procedures," learning about the overall operation of the aircraft.

However, damage resulting from weapons fire may be correctable by resetting specific systems or by using applicable backup systems. In the case of engine damage, the engine must be shut down to prevent the start of fire, or, if a fire has already begun, to keep it from spreading. If a fuel tank is damaged and begins to leak, its remaining fuel can be saved by transferring it to another tank.

These options are available at the pilot and copilot stations. In particular, the electrical, hydraulic, and fuel systems have specific emergency repair and backup features designed to help the EB-52 survive a massive degree of damage and still accomplish its mission.

WARNING

If systems are damaged repeatedly, repairs may not be possible.

Engine Damage

A damaged engine may leak oil, sustain unspecified damage, or catch fire.

Oil Leaks: If an engine begins to leak oil, the OIL warning light in the pilot's eyebrow panel illuminates. If the engine sustains further damage, the engine's trouble light will illuminate.

Unspecified Damage: If an engine suffers damage beyond the normal diagnostic capabilities of the aircraft computers, the afflicted engine's TROUBLE light illuminates. Remedy: Turn off the engine before fire develops.

Fire: If an engine catches fire, its FIRE light will illuminate at the pilot station and a warning claxon will sound. Remedy: It is imperative that an engine on fire be turned off immediately, otherwise the fire will spread.

Fuel Tank Damage

If one of the aircraft's four main fuel tanks is damaged, the copilot interphone light flashes. Primary concern should be given to saving the fuel supply in the damaged tank. Using the fuel system EVS at the copilot station transfer the remaining fuel to the other, undamaged tanks. (Please see "Copilot Station," Chapter 1, for a description of the FUEL button, fuel tank status indicators and transfer switches.)

Electrical System Damage

If a component of the electrical system is damaged, the copilot interphone light and the pilot "E" warning light flash. Three possible courses of action are available using the copilot's EVS (please see "Copilot Station," Chapter 1, for a description of the ELEC button, and electrical system control switches):

1) Check to see if one or more of the four main ac generators is out, and reset it by clicking its number.
2) If a generator won't reset, reset its bus first and then attempt to reset the generator. Generators 1 and 2 operate via the left bus, and generators 3 and 4 via the right bus.
3) If a bus cannot be reset, permanently disabling its generators, turn on the battery switches and then turn on the EMERG DC power backup system.

WARNING

Emergency dc power lasts for only 20 minutes.

The following chart is designed to identify the system that is damaged, the appropriate generator or bus that should be reset to repair it, and whether or not emergency power is available for that system.

Damaged System	Generator	Bus	Emerg. Pwr Available?
TAC	5	right	yes
Altimeter	3	left	yes
Navigator radar	1	left	yes
Navigator STV	7	right	no
EW radar	1	left	yes
EW RLIR	3	left	yes
EW auto jammer	5	right	yes
OW bomb bay doors	7	right	yes
OW air mine launcher	3	left	no
EW chaff dispenser	7	right	no
EW flare dispenser	1	left	no
OW attack radar	5	right	yes
OW camera	1	left	yes
Hydraulic standby pump 1	5	right	yes
Hydraulic standby pump 4	7	right	yes
Hydraulic standby pump 5	1	left	yes
Hydraulic standby pump 7	3	left	yes

Hydraulic System Damage

If any component of the hydraulic system is damaged, the copilot interphone light and pilot "H" warning light flash. Landing gear, brakes, ground steering, flaps, spoilers, CSRL, rudders, bomb bay doors, and inflight refueling doors are all operated hydraulically. (Please see "Copilot Station," Chapter 1, for a description of the HYDRAULIC CONTROL panel and switches.)

WARNING

These systems can also be damaged independently of the hydraulic system. The landing gear and flaps, for example, can be damaged by being extended at excessively high speeds. In such instances, repair is not possible.

Should any of these systems fail due to damage by the enemy or crew error, the following steps should be taken:

1) Check the HYDRAULIC CONTROL panel at the copilot station to determine if one of the engine-driven pumps is out (its light will be ON).
2) If any of the PUMP OUT lights is on, its engine is probably OFF. Unless the engine has been turned off to prevent the spread of fire, attempt to restart it following the "Starting Engines" procedure described at the beginning of this chapter.
3) If the engine cannot be restarted and the damaged pump is number 1, 4, 5, or 7, turn its corresponding STBY pump switch ON.
4) If the electrical standby pump cannot be turned on, its corresponding generator and/or bus may need to be reset. (Please refer to the electrical system reset chart above.)

3 STRATEGY & TACTICS

OFFENSIVE STRATEGY

Loadout

Ordnance

The first strategic decision made in a mission occurs before the aircraft leaves the ground and concerns the weapons that will be most effective in accomplishing the mission objectives.

The OW officer should take special care in reading mission orders noting 1) targets to be hit, and 2) possible enemy defenses that may have to be dealt with along the way. Then, by studying each of the weapons described in the Chapter 5, "Ordnance," a loadout should be prepared that will give the mission a reasonable chance of success, and perhaps a comfortable margin for error.

The aircraft is preloaded with a recommended assortment of weapons for each mission, but this "default" loadout can be changed if the crew wishes. For example, if the flight plan is routed near a number of known enemy airbases, an additional supply of air-to-air missiles may be desired. Or, if an area infested with SAM sites will be encountered, it might be wise to carry additional anti-radar missiles.

Fuel

Loadout also requires a decision about the amount of fuel necessary for the mission. All Persian Gulf missions require an inflight refueling rendezvous, but commanders will need at least 40,000 lbs of fuel to handle takeoff and the distance to the refueling rendezvous.

Beyond those basic considerations, remember that increased airspeed means increased fuel consumption. A concerted effort must be made to conserve fuel. Although the EB-52 has an enormous fuel capacity, it also has an enormous fuel appetite.

High Altitude Demand: Flying at high altitudes requires less fuel. For example, high altitude (20,000 ft+) operations flown at sixty-five percent power result in a fuel flow of 6,000 lbs per hour per engine, or 48,000 lbs of fuel per hour, or eight thousand gallons per hour.

Low Altitude Demand: Low-level operations flown at 80% power use 8,000 lbs per hour per engine—and 100% power is often needed, at an hourly use of around 80,000 lbs per hour. With average fuel consumption at 64,000 lbs per hour on a low-level strike sortie, the aircraft has an endurance of about three hours, or 2,000 nautical miles. For most combat missions, this leaves very little fuel in reserve for emergencies such as fuel leaks, high-drag malfunctions, diversions to alternate landing sites, etc.

On long over-water cruises, fly as high as possible and use no more than 65% power. Descend using idle power, and avoid making steep dives—a steep dive requires full power to recover.

When flying over land, fly at the highest altitudes possible to evade long-range radar coverage. Reduce power to 80% as soon as all threats are eliminated. Gradually climb to higher altitudes after exiting enemy territory.

Remember: It is impossible to have too much fuel on hand.

Targets of Opportunity

Experienced crews take loadout planning a step or two further by studying the mission route for any "targets of opportunity" that might occur along the way—targets other than those listed in the mission orders and on the navigator's large monitor in NAV mode (please see "Navigator Station," Chapter 1). If time and the evasion of detection allow, it may be possible to eliminate a troublesome airfield, radar site, bridge, or road—but only if a supply of ordnance not intended for mission targets is on board. Take special care in attacking such targets, as such activities are certain to attract enemy attention. Plan ahead of time exactly how to evade interception.

Remember: The name of the game is evasion, not confrontation.

Flight Plan

Navigators can edit the waypoints of a mission flight plan to avoid known search radar and SAM sites, or to bring the aircraft closer to specific targets of opportunity, but some things should be borne in mind while doing so:

1) The first waypoint of a flight plan is generally located near the refueling tanker patrol area. For this reason, it is probably best under most circumstances not to change the first waypoint.
2) Waypoints that are the furthest removed from home base—generally deep in enemy territory—are located near the main mission targets. If the navigator chooses to move them, the original locations are referenced in the NAV mode screen listing of mission targets. The original waypoints can be restored easily by selecting EDIT FCS in the MAP panel and selecting RESTORE WAYPOINTS in the small monitor.

Temporary Waypoints

Temporary waypoints (please see "Navigator Station," Chapter 1) can be extremely useful in flying at low altitudes through mountainous terrain, executing bombing runs, and attacking targets of opportunity. Without editing the mission flight plan waypoints, they allow the autopilot to be reprogrammed temporarily while ordnance is being chosen, aimed, and delivered. When a temporary waypoint is reached, the aircraft immediately resumes its original course, freeing the crew to deal with pursuers, enemy sensors, and so on.

NOTE

Although the programmed waypoints of each mission often are directly over targets, and set at the correct altitude for attack, the programmed direction of approach to the target is rarely the best. In short, bombing runs require some manual control of the aircraft. Temporary waypoints especially can be used to great advantage in setting up bombing runs.

Bombing Run

Missions follow preprogrammed strike routes—which can be altered at the discretion of the crew—with a varying number of targets along the route of flight. Tactically, the flight plan is designed to put the aircraft within bombing or missile range of assigned targets, as far out of range of enemy air defense sites as possible, and a few miles away from man-made obstructions (towers, buildings, etc.) that might endanger the aircraft and not show up on the TAC.

Each air-to-ground weapon in the EB-52 arsenal has different uses and delivery requirements. Study the description of a weapon, its homing system (if any), its role in the EB-52 missions, and its targeting specifics before attempting deployment (Chapter 5, "Ordnance"). Read the OW Station description in Chapter 1 for a complete discussion about selecting and delivering ordnance.

Generally it is advisable to plan an attack well in advance, dividing the action into a timed, predictable series of events. This not only guarantees a reasonable degree of accuracy, but also gives the crew a framework within which to react to threats and counterattacks.

Remember: The aircraft is most vulnerable during a low-level bombing run.

A basic three-step bombing run can serve as the framework for most situations:

Approach to Initial Point (IP)

Although targets are generally located near waypoints, the preprogrammed flight plan will rarely follow the best course to the target for a bomb run. The navigator should take control of the aircraft prior to beginning the run and maneuver it, either by using temporary waypoints or overriding the autopilot manually, until it is in a position to make a straight, unobstructed run at the target. When this is accomplished, basic control of the aircraft can be passed to the TAC or autopilot. This initial point, or "IP," should be approximately 30 miles from the target.

IP Inbound

NOTE

Weapon delivery takes precedence over other flight maneuvers when inbound from IP.

The OW officer and navigator control the aircraft inbound from the IP. Minimum time should be spent at the other stations. The EW station AUTO CHAFF and AUTO FLARE switches should be ON. If necessary, the navigator and OW officer can eject chaff and flares manually by using keyboard "hot keys," and make minor adjustments in course direction with the arrow keys.

Speed should not be allowed to drop too low during the bomb run. Sudden emergency maneuvers at low speed can cause the aircraft to stall, and the vulnerability of the bomber to attack increases as its speed drops.

S-turns and slight changes in altitude during the bomb run are useful in keeping the aircraft from following too predictable a path to the target, but remember to roll out of any such maneuvers well in advance (15-20 seconds) of the release point.

WARNING

The size and weight of the EB-52 makes it prone to certain precarious flight situations during bombing runs, These include flying too low, too slowly, and making overly tight turns at low altitude during target approach.

Escape

When the ordnance is finally released, vulnerability of the aircraft to enemy counterattack is at its highest point. 100% power must be used to escape, and the EW and OW officers must mount the most vigilant and active defense possible. The Navigator can use temporary waypoints to set an evasive and unpredictable course from the area, keeping in mind the general mission flight plan, the location of the next IP, and so on.

DEFENSIVE TACTICS

WARNING

Defense of the aircraft takes prededence over other maneuvers, except during bombing runs.

Evasion

It cannot be emphasized too often that the EB-52's best tactical defense lies in evasion. Although the aircraft incorporates low-observable or "stealth" technology—composite structural materials, radar-absorbant materials (RAM) in the skin, radically-shaped tail fins, and so on—its sheer size and design give it a very large RCS (please see "Stealth Modifications," Chapter 4). In daylight it is easy to spot visually, and its eight engines give it a very large infrared signature (it is not unusual for a single B-52 in flight to be mistaken for a flight of four fighter aircraft by radar controllers). In short, once the aircraft is located by the enemy, concealing it again will be difficult.

Most missions are flown at night to minimize the risk of visual acquisition, and the aircraft's stealth characteristics and jamming suite will protect it against most radar-guided threats.

But many modern fighters, surface-to-air missile (SAM) sites, and anti-aircraft artillery (AAA) units use electro-optical sights—low-light TV or infrared (IR) scanners—to find and track targets. Because they do not emit an active radar signal, it is difficult to be forewarned about them.

The best defense against such threats is to avoid them, or to put terrain (such as mountains) between them and the aircraft.

However, if an enemy sensor does manage to locate the aircraft, take the following steps IMMEDIATELY:

1) Turn away from the threat (don't let the autopilot or TAC drive the aircraft mindlessly into danger!).
2) Descend to the lowest possible altitude. If the TAC is on, reduce its setting to the lowest possible level.
3) Increase power to 100% and accelerate out of the area.
4) If the enemy has managed to track or launch missiles against the aircraft, jam the threat and eject chaff or flares as necessary.
5) When the threat ends, cease active jamming immediately, reduce power to conserve fuel, climb to a safe low-level cruising altitude (300-500 ft.), and resume course.

Air-to-Air Defense

To help conceal the aircraft from the enemy, refrain from initiating air-to-air combat. The EB-52 is not a fighter aircraft. Crews that insist on using it as a fighter will not survive.

Attack only if the EB-52 becomes an "item of interest" to a fighter, then maneuver and avoid the area if possible. If the EB-52 is discovered and pursued by enemy fighters, counterattack with speed and authority and return to evasive tactics as soon as possible.

Pilot Recommendations

Speed: The faster the aircraft is out of range of an enemy missile, out of enemy gun sights, or off the enemy's radar screen, the better. Speed also provides a low-altitude flight performance advantage: the aircraft maneuvers better at low altitude at high speed, using the added power to execute sharper turns and climbs, but beware: at high speed it also dives very quickly; at low altitude there would be next to no chance of recovery.

Braking: It is possible to "suck" a pursuer into lethal range (2 miles) of the aircraft's tail-firing Stinger airmine rockets by dumping throttles (rapidly decreasing power to idle) and raising airbrakes.

CAUTION

Observe airspeed during this maneuver carefully. Be prepared to lower airbrakes and increase to full power again before losing too much airspeed.

Navigator Recommendations

The preplanned flight plans are designed to keep the aircraft at the highest or lowest possible altitudes commensurate with known threats, but the navigator must modify the flight plan—possibly with the aid of temporary waypoints— to respond to threats.

EW Recommendations

In general, try to avoid using radar jammers as much as possible. Any electromagnetic emission near enemy territory is like a beacon of light, attracting attention from all directions.

If possible, descend below ground-based search radars instead of jamming them. Ground-based search radars have severe altitude restrictions, particularly below 500 ft AGL, so begin descent when a search radar is encountered. Although search radars feed position information to other more hostile forces, jamming long-range search radars will only alert the enemy that an intruder is nearby and positively mark the EB-52 as a penetrating attacker.

Jamming: At low altitude, do not jam any radar until it identifies the EB-52 as an "item of interest." This is usually determined by the presence of shorter-range height-finding radar emissions, such as ground control intercept (GCI) radars, fighters converging on the aircraft's position, or the appearance of surface-to-air missile (SAM) acquisition radars. Be careful when jamming EW-GCI radars or acquisition radars—jam them only if fighters may be in the area.

Always jam MISSILE LAUNCH and PROXMTY indications. LAUNCH means a fighter's fire control radar or a SAM site has locked onto the EB-52 and is ready to attack. PROXMTY means that the RLIR scanner has detected a missile in the aircraft's rear hemisphere. Both indications require IMMEDIATE jamming and evasive maneuvers. PROXMTY also requires active countermeasures (chaff and/or flares)

Jam all enemy communication frequencies within 30 miles of the initial point (IP) of a bomb run; terminate such jamming after leaving the bomb run area. This may prevent enemy units from alerting other defense sites along the route.

Chaff dispensing technique: 2-3 bundle salvo, then jink or break (execute a short, rapid turn to escape the chaff cloud).

Flare dispensing technique: 2 flares, then break. Continue dispensing prior to each jink or break.

WARNING

When under attack by radar-guided threats, do not dispense chaff without ordering or executing a turn immediately afterwards. Chaff is very effective in "freezing" a tracking radar, but if the aircraft maintains the same heading it will be easy for the radar to reacquire. The same recommendation is made for flares: dispensing flares in a long, bright string without turning away from the original course makes relocation of the aircraft very easy.

Enemy Fighters: Be prepared to jam fighter radars when a fighter's "bat-wing" symbol moves to to the aircraft's six o'clock position or maneuvers above and towards you (attack from above). When in doubt, jam a fighter signal immediately. Cease jamming and radar tracking as soon as possible after the fighter concludes its pass or attack.

Radar Search: If the aircraft is detected by a search radar, descend, eject chaff bundles and jink, and accelerate out of the area.

Radar Track: If the aircraft is tracked by a SAM or search radar, jam the radar signal and descend, eject chaff bundles, jink, and accelerate out of the area.

Missile Launch: If a missile launch is detected, jam either with ECM or IR jammer (depending on the missile seeker-type), eject chaff or flares, break right or left (execute a steep, rapid turn to escape missile seeker's field of view), attempt to acquire the missile visually and turn towards it. Be prepared to maneuver again to defeat a second missile.

Anti-aircraft artillery (AAA) radar: If a triple-A radar is detected, eject chaff bundles, break away from the radar emitter, mark the location and avoid.

OW Recommendations

Air-to-Ground: Limit radar emissions as much as possible. Rely on the passive SCAN radar mode as much as possible. Use the active ATTACK radar only long enough to sweep the area for threats or to locate a target, then return it to "SCAN" as soon as possible.

When a mission target (air or ground) is identified, lock onto it immediately. Use the target lock capability as long as possible, then refine your aiming within 20 seconds to missile release point.

Accurate ordnance delivery positions, as detailed in the OW Control database, must be observed (please see "Copilot Station," Chapter 1, and "Ordnance," Chapter 5).

Air-to-air: Although the EB-52 can carry a large number of air-to-air missiles, chances are against the aircraft in a dogfight with an enemy fighter. Some strategy must be exercised in the use of its missiles to maximize their effectiveness.

It is unadvisable to attempt to maneuver around or behind a fighter. The range of the AIM-120 lets it protect the aircraft from direct attack at distances up to 30km, allowing more time to escape, and is just as effective in head-on engagements as in chases. Its tenacious active radar seeker and tight turning capabilities also allow it to be fired with a reasonable degree of accuracy "over the shoulder"—at moving targets converging on the EB-52 from behind.

The shorter-ranged AIM-9R can be very effective at close range, but must be launched from the rear quarter of the target toward the heat source. Once it locks on, an active optical fuse gives the AIM-9R very low susceptibility to infrared countermeasures, and its turning radius is better than the AIM-120's.

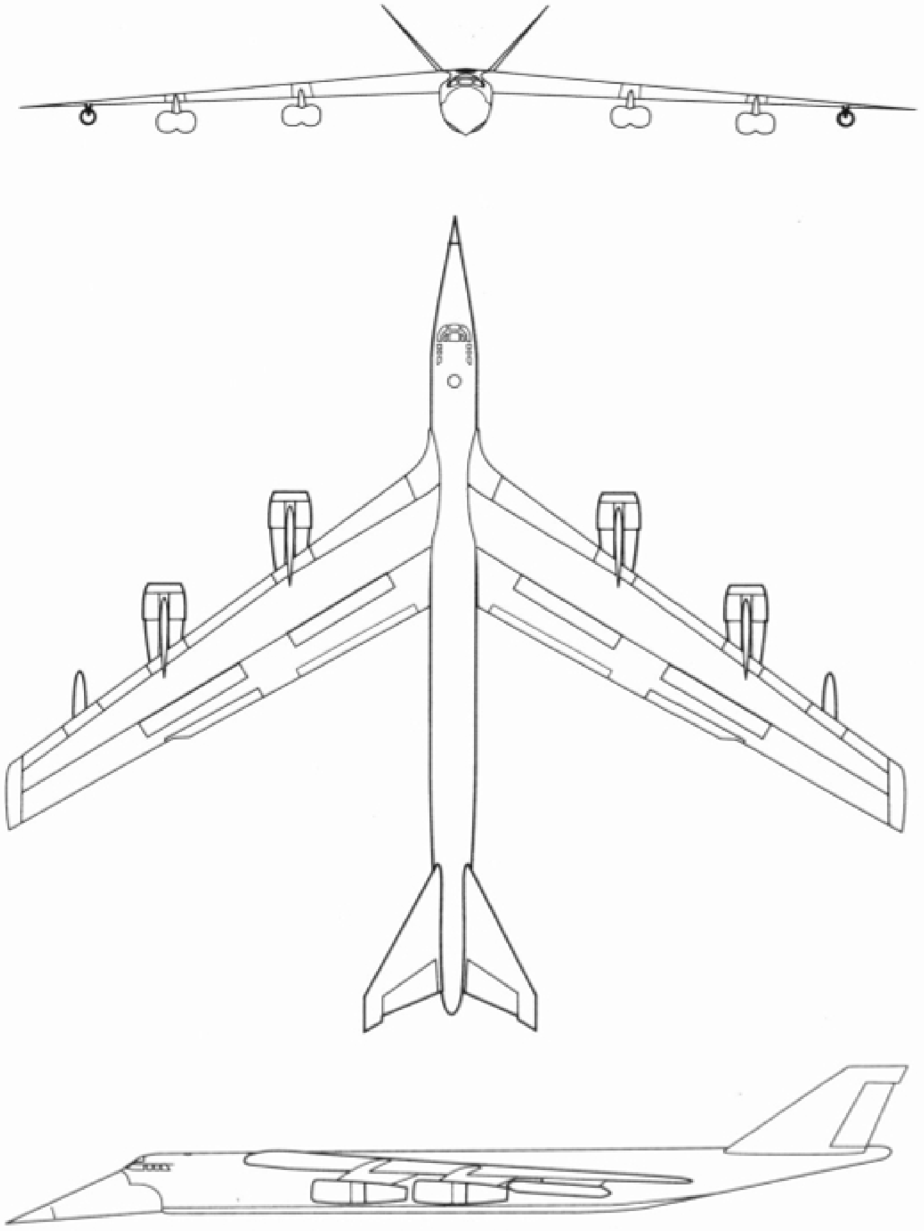
4 EB-52 MEGAFORTRESS BRIEFING

NOTE

This briefing is for general informational purposes only, and is not crucial to the successful operation of the aircraft. Crewmembers are not given direct access to much of the technology described here, as it is employed automatically. The information, however, will assist the curious in understanding many of the aircraft's performance characteristics.

GENERAL DESCRIPTION

The EB-52 is characterized by an SST-style nose, swept wings, V-shaped tail section, four underslung nacelles housing eight turbofan engines, a quadricycle main landing gear, and a tip gear near each outboard engine nacelle. Engine bleed air provides the air supply for air conditioning and anti-icing. Cartridge starters are installed to provide engine starts without assistance from an auxiliary air cart or auxiliary electrical power cart. Primary electrical power is 205-volt ac, provided by four engine-driven generators. Hydraulic pressure is supplied by six engine-driven hydraulic pumps and two electric motor-driven hydraulic pumps. Primary pitch and yaw control is maintained by hydraulically actuated stabilators. Lateral control is maintained by operation of hydraulically actuated spoilers. Together, these same spoilers serve as air-brakes. The V-tail stabilators are adjusted automatically to provide pitch trim.



Up to 18 missiles or bombs can be carried externally on two pylons, one pylon under each wing. A Common Strategic Rotary Launcher (CSRL) is permanently installed in the fore bomb bay, providing umbilical and ejector rack connections for eight air-to-ground missiles. The standard 4-"heavy" bomb rack in the aft bomb bay can be replaced with a CSRL.

Two main wing fuel tanks and a tip fuel tank on each wing provide primary fuel storage, with a maximum capacity of 192,000 lbs (no ordnance loaded).

An electro-optical viewing system (EVS) is installed to provide crewmembers with a black/white visual display of the area outside the aircraft during both day and night missions. A half-duplex UHF Air Force Satellite Communications System (AFSATCOM) terminal is installed onboard the aircraft, providing data automatically in both line-of-sight (LOS) and satellite modes. The aircraft is painted with light- and radar-absorbing black paint, and is free of any external surface protrusions, other than the engines and tail section.

AVIONICS

The EB-52's avionics include all of the electronic devices and equipment that make up its control systems. Many basic subsystems are not mentioned here but can be studied through their respective manufacturer's documentation. The systems that are included are divided into three groups: mission management, sensor management, and vehicle management.

Mission Management

Navigation

GPS: The EB-52 relies on Satellite Global Positioning System (GPS) navigation, with position accuracy down to twenty feet, time down to one hundredth of a second, and ground speed down to the quarter-knot. The inertial navigation system (INS) uses a ring-laser gyro to maintain heading accuracy to the tenth of a degree after twelve un-updated hours. The satellite navigation system locks onto two of eight Air Force navigation satellites orbiting the earth and fixes its position once every five minutes.

The on-board radar navigation system interfaces with the GPS and uses a plug-in Data Transfer Module (DTM) with mission navigation points and subroutines preloaded. The DTM is loaded automatically when a particular mission is accepted. The navigator's combination TV monitor/computer can be used to reprogram the navigation system during a mission.

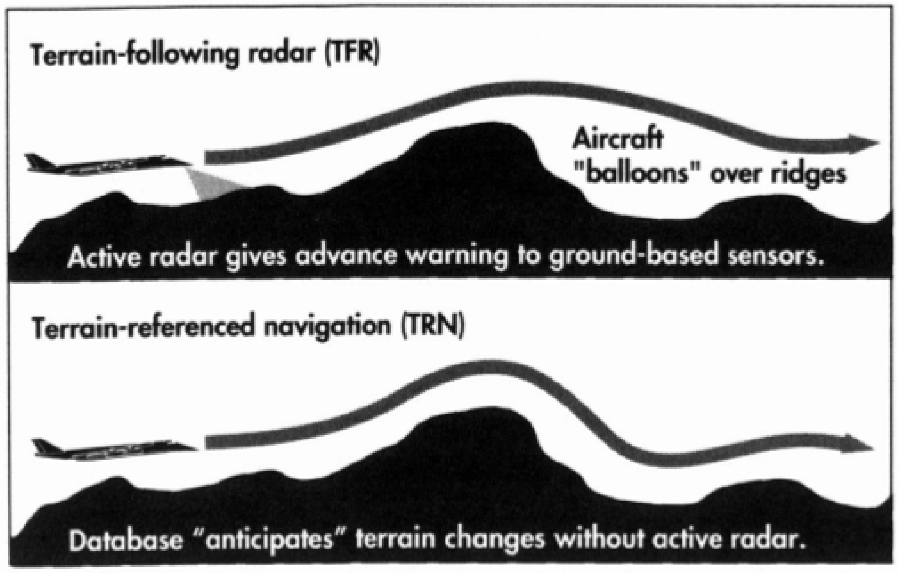
FCS: The digital automatic Flight Control System (FCS) (please see "Multi-Station Instruments" and "Navigator Station," Chapter 1), or "autopilot," provides a significant increase in reliability over older analog systems. The digital unit has a new control system that streamlines operations, and also deletes the servo switches on the pilot's left side panel. The FCS is primarily a two-axis system (pitch and roll) which provides auto-steering and steering override modes during flight.

The onboard GPS and INS systems send present position, heading, and ground speed information to a computer preloaded with terrain and man-made obstacle information. The terrain avoidance computer (TAC) uses that information to determine location and direct the autopilot to keep a safe altitude during low-level operations. The FCS does not depend on radar, thereby eliminating electronic emissions.

TAC: The EB-52 terrain avoidance computer (please also see "Pilot Station," Chapter 1) uses a Terrain Referenced

Navigation (TRN) system. TRN relies on measurement of the profile of the terrain passing beneath the aircraft and its comparison with geographic data from the DTM. Measurement is made using the aircraft's AN/APN-224 passive radar altimeter.

A conventional terrain-following radar (TFR) directs a detectable active radar beam at the ground and "sees" only the terrain directly ahead of the aircraft. It has no information on terrain concealed by ridge lines. Such hidden terrain is not detected until the aircraft is right upon it, causing the aircraft to "balloon" past the location before getting back down to the lowest possible altitude. Worse yet, this advancing active radar beam may provide early warning of the aircraft's approach to enemy sensors.


Terrain-following radar (TFR)
Aircraft "balloons" over ridges
Active radar gives advance warning to ground-based sensors.
Terrain-referenced navigation (TRN)
Database "anticipates" terrain changes without active radar.

With its database of mission area details, the EB-52's TRN system "knows" and anticipates the profile of the ground far ahead of the aircraft's current position, even if the region is concealed by ridges or peaks. The TRN system initiates pull-up and descent maneuvers at the optimum time, minimizing sudden unwanted gains in altitude.

The accuracy of the EB-52 TRN system is approximately 140 ft in the horizontal plane and 8 to 18 ft vertically.

AFSATCOM: The EB-52 carries the AN/ASC-19 Air Force Satellite Communications (AFSATCOM) system, including an AN/ARC-171(V) auxiliary UHF command radio.

Navigator Radar: The AN/ALQ-161 Navigation Radar provides high resolution imaging of an area up to 40 miles ahead of the aircraft at the Navigator's station, and a low resolution image of an area up to 30 miles ahead at the Pilot station.

Fire Control

Fire Control System: The EB-52 is equipped with a modified AN/ASG-15 fire control system that coordinates all elements of the aircraft's complex weapons delivery systems. Missiles are launched from the OW station against inflight-selected targets. (Please see "OW Station," Chapter 1, and "Ordnance," Chapter 5.) Targeting equipment interfaces automatically with the bombing-navigation system (BNS), radar altimeter, and aircraft electrical, bleed air, and body hydraulic systems. A new digital (rather than analog) solid-state system provides automatic target lock and identification capabilities in radar, stv camera, and laser guidance modes. The computer analyzes selected ordnance in relation to specific targets, advising the OW if a weapon is inappropriate for a target. An emergency ordnance jettison capability is provided.

Attack Radar: The AN/APQ-166 "Strategic Radar" offensive avionics system (OAS), replaces the original OY-73/ASQ-176 radar set. This active attack radar system incorporates a digital computer, new controls and displays, an improved radar processor, and a modified radar antenna.

EW Systems

Electronic Countermeasures (ECM): The AN/ALQ-172 is the EB-52's primary active countermeasures system. In its automatic mode, the system identifies each threat individually and counters it with a specific ECM program optimized against that threat. If a threat cannot be specifically identified, the system responds with a "generic" program.

IR Jammer: The EB-52 IR jammer uses an IR laser to confuse IR seekers. The system uses a gimbal-mounted low-powered laser to detect and jam incoming IR missiles automatically.

Flare Ejectors: Twelve AN/ALE-20 Dynalectron-designed flare ejectors are located in the aft fuselage of the EB-52. Each dispenser holds five AN/ALA-17 flares. Flares can be programmed to fire automatically on the command of the rear-looking infrared (RLIR) system (please see "Sensor Management," below), or can be ejected manually.

Chaff Dispensers: Four Lundy AN/ALE-24 chaff dispensing systems are located in each wing of the EB-52 in an area previously used by the aileron actuators and controls. Each dispenser holds 75 chaff bundles. The dispenser chutes are on the underside of the wing between the two flap sections. Locating the dispensers in the wings yields an effective countermeasures capability due to the high air turbulence, and reduces chaff contamination to the aircraft. Chaff bundles can be programmed to fire automatically on the command of the RLIR system (please see "Sensor Management," below), or can be ejected manually.

Sensor Management

RLIR: the AN/AAQ-12 Rear Looking Infrared (RLIR) system consists of a scanner assembly and signal processor. The system provides target information, alerts the crew, and and is capable of dispensing chaff, flares, and air mines automatically. RLIR controls are located at the EW station. The RLIR locates and identifies any IR-producing threat approaching from the rear quadrant of the aircraft. Its range is 30 miles.

IFF Transponder: An AN/APX-64 IFF (Identification Friend or Foe) Transponder provides for Mark X IFF with selective identification feature (SIF), automatic altitude reporting, and Mark XII (Mode 4) encrypted IFF.

EVS: The AN/ASQ-151 electro-optical viewing system (EVS) consists of a Westinghouse AN/AVQ-22 steerable low-light level black/white television (STV) unit and a data presentation system. The EVS provides crewmembers with a visual presentation of the area surrounding the aircraft for low-level penetration during both day and night missions. To accomplish this function, the EVS uses the steerable STV to supply video, which is displayed on monitors at all stations. Since the STV can be manually positioned to a wide range of angles generally forward of the aircraft's flight path (360° from the OW station), it also is used as an aid in weapon targeting and delivery. At the navigator's station, the EVS also receives input signals from the OAS, terrain avoidance computer, and altitude and airspeed sensors, which are converted to symbology suitable for TV display and are overlayed on the EVS monitor.

The EVS sensor is located in a recessed cavity on the underside of the aircraft. The STV cavity is immediately below the cockpit on the centerline of the aircraft. The cavity is covered with an optical window to protect the sensor.

The AN/AVQ-22 STV system includes the camera assembly, a camera electronics unit, and control panels located at the navigator and OW stations. It provides a quality picture across a wide range of light conditions, day or night. Automatic light control circuits are used to adjust the picture as the ambient light situation changes during flight, though the navigator has manual brightness controls independent of the OW station EVS.

Vehicle Management

Electrical System

Two electrical distribution buses supply power to the left and right sides of the aircraft. Primary power is supplied by four engine-driven generators and constant-speed drives mounted on engines 1, 3, 5 and 7. The drives maintain each generator at 6,000 rpm to produce the desired constant frequency (400 Hz). This 118/205 volt three-phase ac power is used for most heavy loads such as boost pumps and wing flap motors. Single-phase 118 volt ac power is used for small motors, actuators, heating, and some electronic equipment.

Primary dc power is produced by eight transformer-rectifier (TR) units which receive the 205 volt ac, step it down, and rectify it to 28 vdc. Of the eight TR units, three power the aft dc system and are located in the aft fuselage. The remaining five TR units power the forward dc system and are located in the right forward wheel well. Two batteries located in the forward wheel wells provide an auxiliary source of 24 vdc power which is supplied to essential and emergency equipment in case of total power failure. A separate nickel-cadmium battery is installed to provide power for the emergency weapons jettison system. Aircraft ac and dc power is also provided to weapons in the bomb bays and suspended on the wing pylons.

Hydraulic System

Landing gear, brakes, ground steering, flaps, spoilers, CSRL, rudders, bomb bay doors, and inflight refueling doors are all operated hydraulically. Controls for the hydraulic system are located at the Copilot station.

The hydraulic system of the EB-52 differs from a conventional system in decentralization. Instead of the standard single main system, there are six independent engine-driven systems consisting of inboard and outboard right and left wing hydraulic systems and right and left body hydraulic systems. The engine-driven systems, which supply normal pressure to the wing and body systems, are mounted on the right side of engines 1, 3, 4, 5, 6, and 7. In addition, there are two electric motor-driven primary hydraulic systems, which supply normal pressure to the No.1 and 2 rudder/elevator hydraulic systems, and are mounted on the right side of the aft fuselage. Four electric motor-driven standby pumps, available for use in all systems except the inboard wing spoilers, are installed at the left and right wing trailing edge locations and left and right body locations.

The engine-driven pumps have a rated flow of 12 gallons per minute at an output pressure of 2,800 psi, with a cutout pressure of 3,000 psi. Each electric motor-driven standby pump has a rated flow of 3 gallons per minute at 1,300 psi. Oil-air type accumulators are incorporated to provide air preload pressure for accelerating the operation of outboard wing system components and certain body system components.

Air Conditioning

The air conditioning system is operated from the copilot station. It provides crew compartment ventilation and pressurization, piped cooling to electronic equipment, and emergency ram air ventilation. High pressure hot air from the bleed air system provides the energy to air condition and pressurize the crew compartment, using the equivalent of approximately 6% of the thrust output of one engine. The air conditioning pack located just aft of the crew compartment cools the hot bleed air by means of two air-to-air heat exchangers and an air cycle machine. The cold air supply is divided between crew and equipment cooling so the crew will receive up to 75% of the cold air output. Cabin pressure is regulated by controlling the outflow of air from the cabin.

Other Systems & Components

Engines: The EB-52 is powered by eight Pratt & Whitney model TF33-P-3 (JT3D-2) low-bypass turbofan engines. The engines are mounted in pairs, in four nacelles suspended below the wings, and are numbered 1-8 from left to right.

The engines are identical except for the engine mounted accessories, which are driven by way of an accessory gearbox. A 120 volt ac generator with a constant speed drive is installed on the lower left side of engines 1, 3, 5, and 7. Engine fan air cools the generators via an air-oil cooler and is vented from under the afterbody cowling. An engine-driven hydraulic pump is installed on the lower right side of engines 1, 3, 4, 5, 6, and 7. Electrically controlled air-drive starters are installed on the lower side of each engine. All engines have cartridge start capability.

Cartridge Starter: The EB-52 employs upgraded cartridge starters on all eight engines to facilitate a starting capability independent of ground support. Spare cartridges carried board the aircraft guarantee at least one restart per engine in flight, should the air-drive starter fail. The starter turbine uses high-pressure gas generated by the burning solid propellant cartridge.

Fuel: There are four main tanks on the EB-52, including two integral wing tanks and two outboard wingtip tanks. Total fuel capacity is approximately 192,000 lbs (no ordnance loaded). The fuel supply system is designed so that each engine receives fuel from its nearest tank. The left wing tank supplies engines 1 and 2, the left wing tank engines 3 and 4, and so on. A crossfeed manifold system is provided that makes it possible to supply any engine from any tank, and allows fuel to be transferred out of damaged tanks.

Inflight Refueling: An air refueling system makes it possible to refuel the aircraft in flight from a boom-type tanker aircraft. An air refueling slipway and receptacle, which is covered by hydraulically operated slipway doors when not in use, is located on top of the fuselage slightly aft of the pilot's stations. When the air refueling boom nozzle is seated in the air refueling receptacle, it is held there by automatically operated latching toggles.

Oil: Each engine is provided with an integral oil system, including an oil tank with a minimum usable capacity of 7.1 gal. and a total capacity of 10.23 gal. Oil is supplied to engine-driven oil pressure pumps which supply the engine bearing and accessory drives. Scavenge pumps remove the oil from the engine compartment, route it through an oil cooler, and return it to the tank for reuse. The system is entirely automatic.

Landing Gear: The landing gear on the EB-52 includes four main gears and two tip protection gears. The landing gear are electrically controlled, hydraulically actuated, and automatically locked. The dual wheel main landing gears are in a quadricycle arrangement with two side-by-side forward gears and two side-by-side rear gears. The tip protection gear support the wing under high gross weight loading conditions and provide shock cushion during take off, taxi, and landing. They are located between the outboard engine strut and the external fuel tank. The landing gear can be fully retracted in 10 to 15 seconds and extended in 15 to 20 seconds.

Brakes: Rotor-type brakes are installed on all eight main gear wheels. The brakes on all wheels are identical.

Stealth Modifications

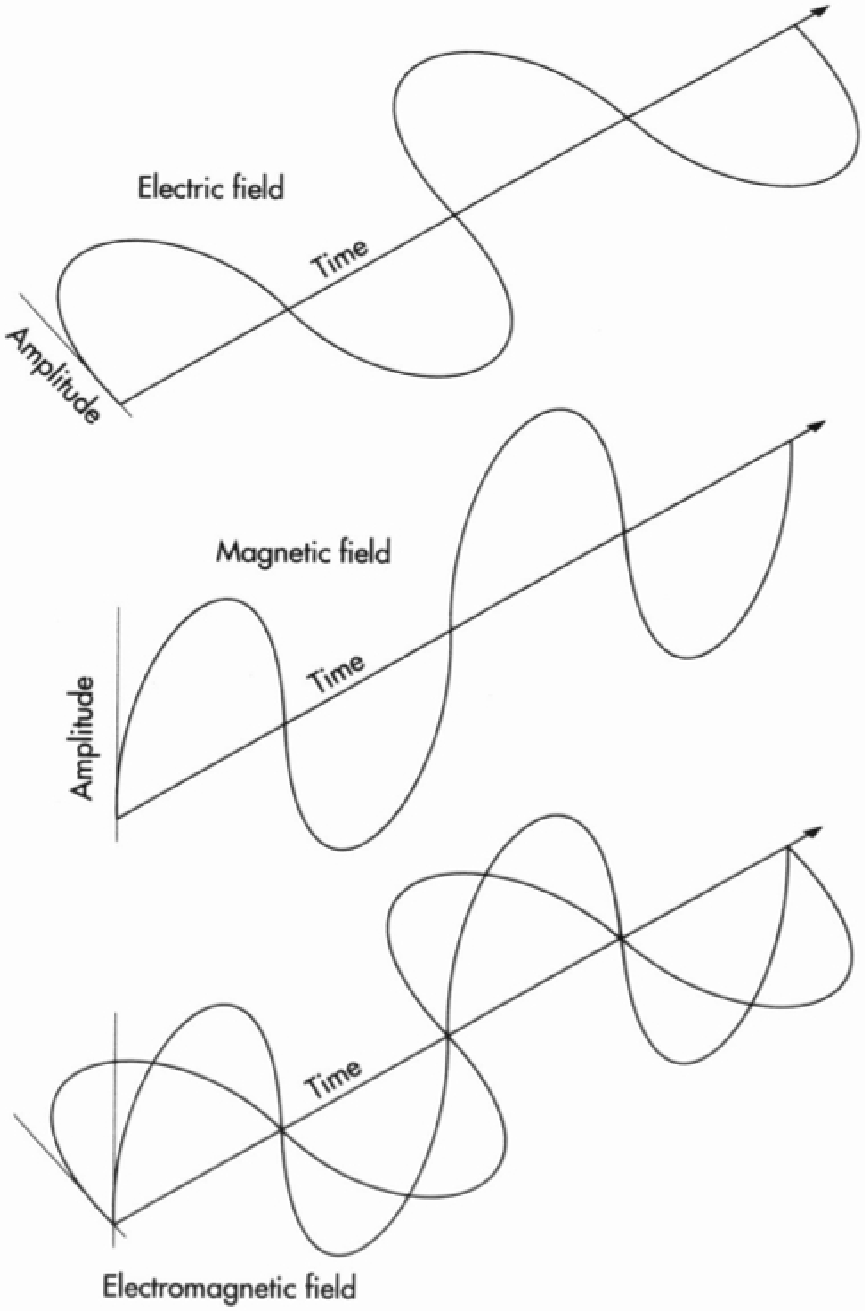
The EB-52 originally served as a relatively inexpensive test-bed for stealth technology intended for the B-1 bomber. Rather than devote one of the very expensive and controversial B-1 bombers to the purpose, engineers at Dreamland (the USAF super-secret test facility surrounded by the Nellis AFB bombing ranges) tested the effects of "low-observable" modifications on the well-known radar characteristics of a B-52H. Through application of radar-defeating composite materials, electronic countermeasures, and overall airframe modeling, the effective radar cross section (RCS) of the B-52 was reduced by half in the resulting EB-52.

To grasp the importance of this achievement to the performance of the aircraft, a rudimentary understanding of radar and "RCS" is necessary. Unfortunately, this introduction must be brief and a wealth of detail about the subject left out. A large degree of patience is requested of those readers possessing a deeper knowledge of the technology than is presented here.

Electromagnetic Waves

Radar waves are a form of electromagnetic radiation, as are the lower frequencies used for radio and TV and the higher frequencies such as infrared energy and visible light.

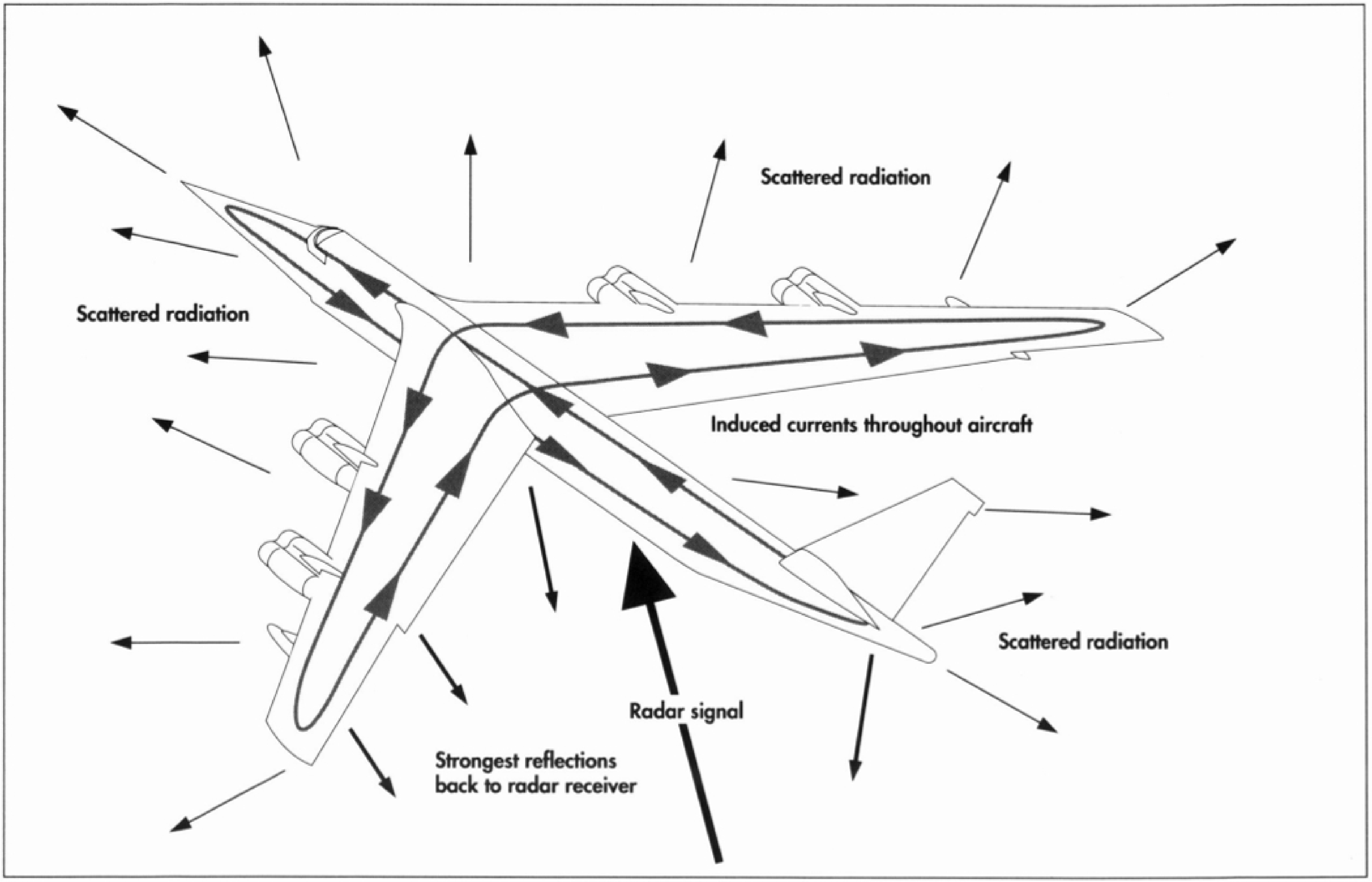
An electromagnetic wave consists of two components—an electric field and a magnetic field—at right angles to each other. Their values fluctuate rapidly in strength, rising to a peak, falling to zero, descending to a trough in the opposite direction before rising again to zero. The process repeats over and over again as the whole electromagnetic wave travels (or "propagates") in a direction at right angles to the electric and magnetic fields.



Radar

Radar sets illuminate or "paint" targets with a beam of high-frequency radar energy and detect the resulting reflections. A cat's eyes provide a good analogy. Lost in the shadows, a cat is virtually invisible. Caught in the beam of a flashlight, however, its eyes reflect the visible light and mark its hiding place instantly.

But the word "reflect" simplifies a complex process. Radar energy doesn't bounce the way a rubber ball bounces. An electromagnetic wave meets an electrical conductor, such as a wire, and creates electrical and magnetic currents in the conductor at the same frequency. That is how radio antennas work: an electromagnetic wave from a transmitter creates a small current within the antenna. The radio receiver senses the signal and amplifies it.


Scattered radiation
Scattered radiation
Induced currents throughout aircraft
Scattered radiation
Radar signal
Strongest reflections back to radar receiver

The transmitter works the other way around. The transmitter feeds an electrical current of the appropriate frequency into the antenna. The current creates an electromagnetic wave that radiates from the antenna.

This is why aircraft and other targets "reflect" radar energy. The radar wave hits the aircraft and induces electric and magnetic currents throughout the components of the object—wings, fuselage, internal and external components all become conductors of electrical currents matched to the radar signal's frequency and wavelength. Ultimately, simply by the act of flowing, these currents cause their own electromagnetic wave to be generated. The radar emitter sees this newly generated wave as a "reflection" of the original signal.

This process is called "scattering;" the newly created waves are referred to as the "scattered field." Stealth technology attempts to control the scattering, minimizing the amount of "reflected" energy detected by the the radar.

Passive & Active Radar

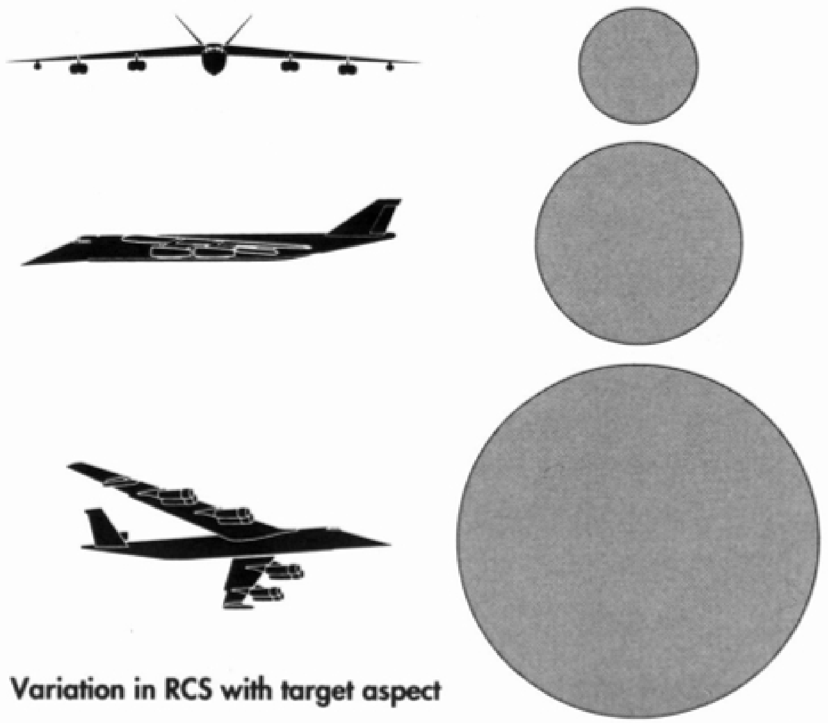
Radars are often refered to as being "active" or "passive." The distinction is fundamental, in that it describes whether a radar "actively" generates a beam of radar energy to create an echo in any object encountered, or whether the radar "passively" waits for electromagnetic emissions from an object to strike its antenna.

Because the passive radar sends out no beam of its own, it cannot announce its presence to enemy sensors and is naturally the more stealthy of the two types. On the other hand, because it relies on the energy emitted by an object to mark the object's location, a passive radar is also less likely to sense everything in its vicinity, in particular other passive radars and aircraft that have been modified for stealth.

The EB-52 incorporates both types of radar. The OW station ATTACK radar is "active." It is used when stealth is less important than knowing exactly where threats—such as enemy fighters—are located. The ATTACK radar should generally be turned on only briefly—just long enough to spot anything missed by the EW station passive scanning radar—and then shut down to avoid giving away the aircraft's location.

Radar Cross Section (RCS)

The radar cross-section of an aircraft is defined as being the size of a sphere that would reflect the same amount of radar energy as the aircraft being measured. The RCS in square meters is the area of a circle with the same diameter as the imaginary sphere.

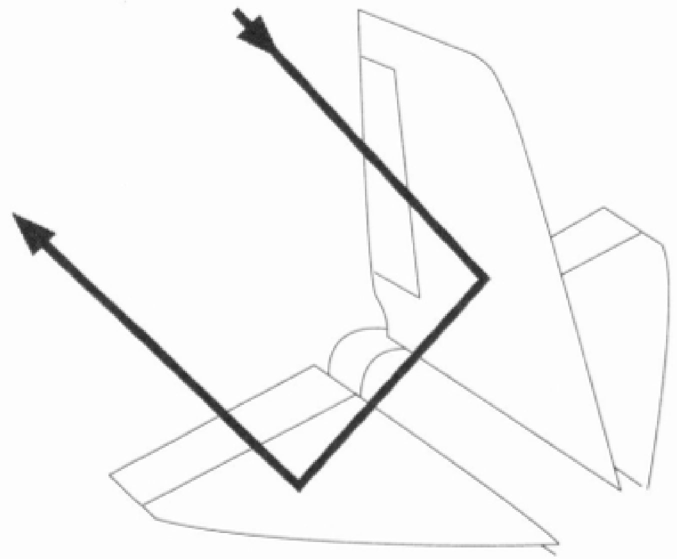


Variation in RCS with target aspect

Note that RCS is not a constant, stable characteristic of any aircraft. "It is essential to realize that the cross-section of a given target will depend not only on the wavelength, but also upon the angle from which the target is viewed by the radar," wrote E.M. Purcell in his 1947 book *Radiation Laboratory*. This means that RCS will fluctuate radically with target aspect, due to interference between the reflected waves from different parts of the target.

Dihedrals

Another major concern in stealth technology is the dreaded "dihedral"—an area created when two metallic surfaces are positioned at 90 degrees to one another. An incoming radar signal enters the right angle formed by two such surfaces and carries out a "double-bounce", returning in exactly the opposite direction as the incoming signal.



Two surfaces at 90° return a radar signal directly to its source.

To limit this problem in the EB-52, engineers replaced the traditional horizontal/vertical stabilizer empennage with a backswept V-shaped tail. The fins of the shorter, more streamlined tail are cast at an angle that cannot bounce a signal directly back to the originating emitter.

Corners

The "double-bounce" phenomenon can occur to some degree at any corner reflector in a modern warplane. To imagine a corner reflector in action, consider again the "cat's eye" analogy mentioned above. It doesn't matter which angle the eyes catch the light from, some amount is reflected back at the source. And the more powerful the flashlight, the brighter the eyes shine. Radar works the same way on a corner reflector.

In the EB-52, hundreds of external protrusions have been eliminated. Even the seams between sheets of the aircraft's composite skin have been painstakingly removed or hidden.

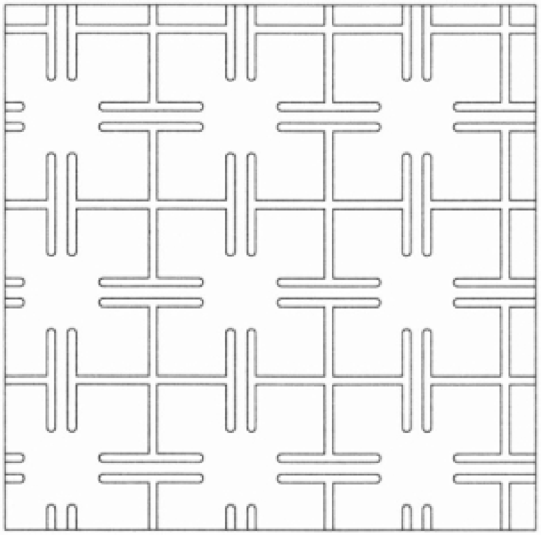
Yet, despite the extraordinary steps taken in reducing the aircraft's RCS, underwing pylons remain at right angles to the wing lower surfaces, cruciform wings and fins of missiles and bombs still sport the dreaded dihedrals, and common features such as spoilers and flaps add their share of 90 degree corners and cavities.

Radar Absorbing Materials (RAM)

There are two broad classes of RAM. Resonant absorbers are designed for use at a specific frequency but maintain some effectiveness over a range of frequencies on either side of the primary operating point. So-called "broadband" RAM maintains effectiveness over a much wider range of frequencies. This latter type of material characterizes most of the RAM used in the EB-52.

The EB-52's skin is composed of fibersteel—a broadband absorber made of fiberglass and carbon steel, stronger than steel but as radar-transparent as plastic.

Overlaying the skin is a fine mesh network of circuit analog (CA) absorbers. Made of conductive material, these tiny circuits are arranged in geometric patterns such as thin strips, grids, crosses, or more complex shapes. The material offers higher performance within a given volume than simpler types of RAM, but had to be custom-designed for the EB-52, a task that could be handled only by a powerful computer.



Circuit Analog absorber pattern

CA absorber technology is also used in the window glass of the EB-52, providing a marked degree of stealthiness for the cockpit area. Embedded within all glass in the aircraft is a network of thin wires, cut in various dipole (half-wavelength) lengths. Combined with an inner conductive layer, this treatment turns each window into a CA absorber.

Ferrite Paint

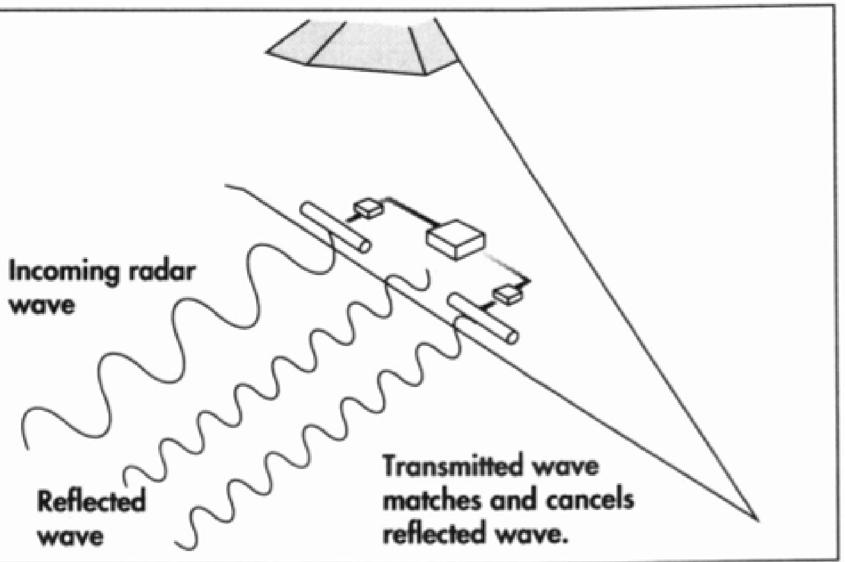
The surface of the EB-52 is coated with black ferrite, or "iron ball" paint. Despite its weight, and difficulty in being applied, this "anti-searchlight" black paint is thin and maintains RAM effectiveness down to sub-gigaHertz frequencies. In addition, its totally nonreflective pigmentation makes the aircraft virtually invisible against a night sky, even when painted by a visible spectrum searchlight.

Structural Materials

The designers of the EB-52 further reduced the aircraft's RCS by restructuring the skeleton of the aircraft using Radar-Absorbent Structural (RAS) materials, created by combining RAM with rigid radar-transparent substances. RAS materials are highly classified, and additional information cannot be supplied here.

Cancellation

The EB-52 avionics system automatically attempts to cancel radar waves. An incoming radar wave is sampled by a receiving antenna. The computer, having predicted the aircraft's reflectivity at this frequency and angle, creates and transmits a false echo—a signal designed to cancel out the genuine reflection from the aircraft's skin.

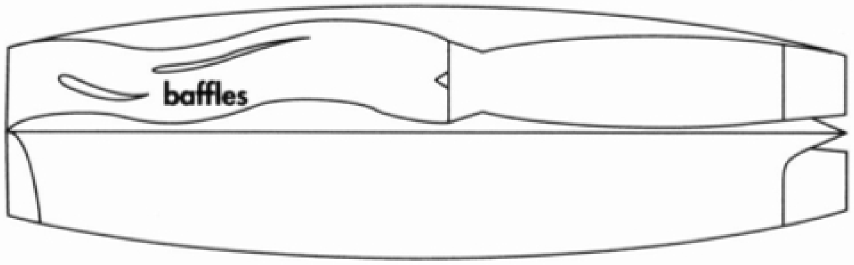


To accomplish this, aircraft-mounted sensors measure the frequency, waveform, strength and direction of the incoming signal. Complex signal processing equipment predicts how the incoming wave would reflect. It then creates and transmits an appropriate cancellation signal. Cancellation need not be 100% successful to be useful, and the task of matching the cancellation signal to the threat is reduced in magnitude by automatically reducing the threat sector and frequency range countered.

Infrared

Given present-day sensor technology, passive IR offers the only realistic option to radar for the long-range detection of aircraft targets such as the EB-52. With the growing use of IR sensors as a radar substitute, measures have been taken to reduce the thermal signature of the EB-52.

The main sources of IR energy are hot metal components of the engine turbines and the exhaust nozzles, components which have been heated by the 1,800 — 2,300°F (1,000 — 1,300°C) engine efflux. The efflux itself adds relatively little—less than 10% of the total IR emissions come from the aircraft's eight turbofan engines.



The internal ducts of the engines were also redesigned with baffles that trap and redirect radar waves instead of reflecting them directly back to their source.

The hot interior of the tailpipe is visible over a conical sector to the rear of the aircraft. Outside of this sector, an IR sensor sees only the outside surface of the nozzle, the temperature of which is markedly lower. Exhaust systems on the EB-52's engines are made of reinforced carbon-carbon (RCC). Created by baking and carbonizing a material containing carbon fibers, RCC is strong and very heat-resistant, and more than 15% cooler in operation than traditional exhaust materials.

Stealth technolgy also attempts to reduce sources of IR energy other than the engines. An obvious target for treatment are the exhaust plumes, which must be cooled quickly by mixing the flow of hot gas from the core with cooler by-pass air. Although the turbofans already accomplish this to a certain degree, it is taken a stage further in the EB-52 by using additional air to provide a cool shroud around the exhaust.

Airframe Heat

The infrared Achilles heel of the EB-52 is the airframe—a constant source of detectable IR energy. This heat comes from several sources—the engines, the avionics, and the thermal effects of friction with the atmosphere at high speed.

At present, most combat aircraft simply dump the heat gathered by the cockpit and avionics cooling systems, but the EB-52 attempts to deal in part with the problem by dumping heat collected through the cooling systems into the fuel, a technique pioneered in the SR-71 Blackbird. This technique is only partially effective, and it must be remembered that infrared and low-light TV sensors pose the greatest threat to the aircraft.

5 ORDNANCE

The Megafortress is capable of delivering approximately 50,000 lbs of mixed ordnance. Up to 18 missiles or bombs can be carried externally on two pylons, one pylon under each wing. A common strategic rotary launcher (CSRL) is permanently installed in the fore bomb bay, providing umbilical and ejector rack connections for eight air-to-ground missiles. The standard 4-"heavy" bomb rack in the aft bomb bay can be replaced with a CSRL.

AIR-TO-AIR MISSILES

AIM-9R Sidewinder

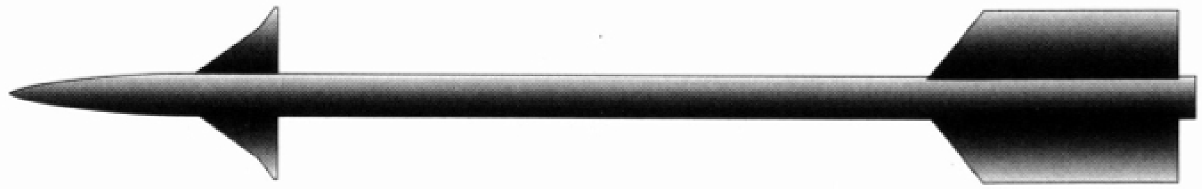
Role: The AIM-9R gives Megafortress a close-range defensive weapon to use against rapidly approaching or maneuvering enemy fighters.

Description: The AIM-9R is a fourth-generation Sidewinder built for the USAF and USN, with all-aspect intercept capability.

Operation: Within the missile's range,

1) Lock onto enemy aircraft (weapon is wasted against ground-based targets).
2) Launch weapon.

AIM-9R Sidewinder



Specifications

Range	10+ miles	Weight	193 lb.
Warhead	High explosive, 22.5 lb.	Powerplant	Solid propellant rocket
		Speed	Mach 2+
Guidance	Solid state imaging infrared	Dimensions	length: 9 ft. 5 in. body diameter: 5 in. fin span: 2 ft. 1 in.

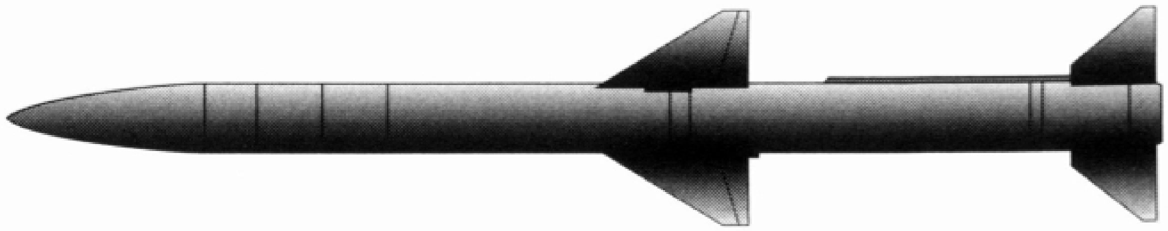
AIM-120C AMRAAM

Role: The AIM-120C advanced medium range air-to-air missile (AMRAAM) is the Megafortress' first line of defense against enemy fighters. Its 30+ mile range allows Megafortress to attack an enemy fighter from a distance, before being forced into a close-in defensive position.

Description: Originally a replacement for the AIM-7 Sparrow, the advanced medium-range air-to-air missile (AMRAAM) provides an all-weather, all-environment defensive capability for Megafortress.

The AIM-120C has inertial mid-course guidance and active radar terminal homing, and is the USAF's primary "fire-and-forget" air-to-air missile. Significant improvements in operational effectiveness include increased average velocity, reduced miss distance, improved fusing, increased war-head lethality, multiple target engagement capability, improved clutter rejection in low-altitude environments, improved ECCM capability, increased maximum launch range, reduced-smoke motor, and improved maintenance and handling.

AIM-120C AMRAAM



Specifications

Range	31 miles	Weight	340 lb.
Warhead	45 lb. blast fragmentation	Powerplant	Solid propellant rocket
		Speed	±Mach 4
Guidance	Inertial midcourse, w/active radar terminal homing	Dimensions	length: 12 ft. body diameter: 7 in. span of tail control fins: 2 ft. 1 in.

Operation: Within the missile's range,

1) Lock onto enemy aircraft (weapon is wasted against ground-based targets).
2) Open bomb bay doors, if necessary.
3) Launch weapon.
4) Close bomb bay doors.

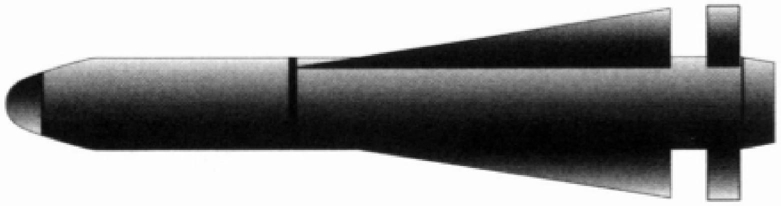
AIR-TO-GROUND MISSILES

AGM-65G Maverick

Role: The AGM-65G is especially useful in destroying hardened, high-priority military targets such as aircraft shelters and bunkers.

Description: The AGM-65 is the Air Force's primary "fire-and-forget" air-to-ground missile. While original versions of the Maverick were limited by their TV targeting systems to operation in clear weather, the "G" variant carried by the Megafortress has an infrared seeker that can locate and home on targets despite poor weather conditions. The 65G also has an digital autopilot and a pneumatic (rather than hydraulic) actuation system.

AGM-65G Maverick



Specifications

Range	14 miles	Weight	462 lb.
Warhead	298 lb. blast fragmentation (for use against hardened targets)	Powerplant	2-stage solid propellant rocket
		Speed	Subsonic
Guidance	Self homing (fire-and-forget) infrared imaging.	Dimensions	length: 8 ft. 2 in. body diameter: 1 ft. 0 in. wing span: 2 ft. 4.5 in.

Operation: Within the missile's range,

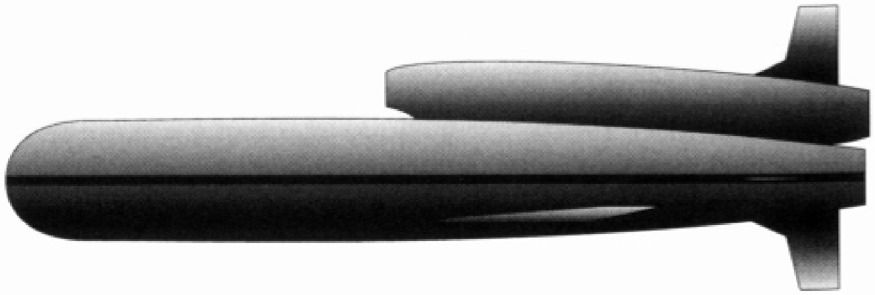
1) Lock onto heat-generating ground target.
2) Open bomb bay doors, if necessary.
3) Launch weapon.
4) Close bomb bay doors.

AGM-136A Tacit Rainbow

Role: Launched ahead of the Megafortress, the missile cruises at subsonic speeds over the intended attack route to seek and destroy radars associated with surface-to-air missile (SAM) sites and anti-aircraft artillery (AAA).

Description: Northrop's AGM-136A Tacit Rainbow anti-radiation missile (ARM) is designed to seek out and destroy enemy air defense radar systems. Unlike most ARMs, Tacit Rainbow is designed to loiter on its own for extended periods and automatically attack enemy radars when they are activated. The missile stores the locations of ground-based radar emitters in the memory of its guidance system. Even if the emitters are turned off, the 136A can select the most important one and prosecute its terminal dive attack with considerable accuracy.

AGM-136A Tacit Rainbow



Specifications

Range	56 miles	Weight	1,268 lb.
Warhead	40 lb. high explosive	Powerplant	Turbofan engine
		Speed	600 mph
Guidance	Passive radar homing	Dimensions	length: 8 ft. 4 in. body diameter: 2 ft. 3 in. wing span: 5 ft. 1.5 in.

Operation:

1) Open bomb bay doors, if necessary.
2) Launch weapon ahead of the EB-52, into the general vicinity of expected enemy radar activity.
3) Close bomb bay doors.

The AGM-136A will locate and attack a target, or self-destruct when its fuel supply is exhausted.

AGM-88A HARM

Role: The AGM-88A high-speed anti-radiation missile (HARM) is designed to defend the Megafortress against radar emitters associated with SAM and AAA sites.

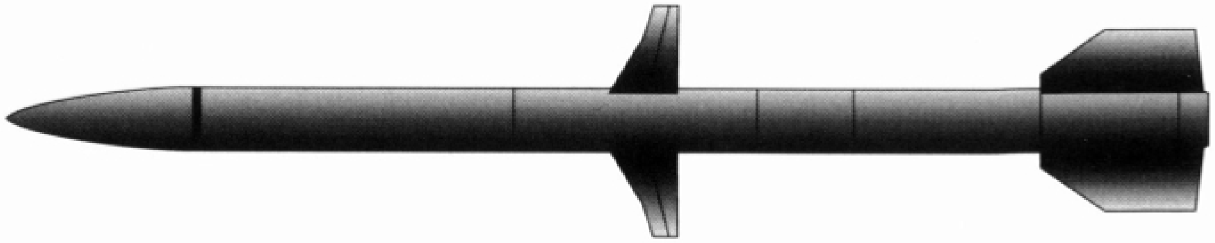
Description: The AGM-88A emphasizes high speed in attacking radar emitters, reflecting experience gained in Vietnam, where Soviet-built surface-to-air missile (SAM) radar systems sometimes detected the approach of first-generation AGM-45A Shrikes and ceased operation before the missiles could lock onto them. The HARM continues homing even if the targeted emitter closes down.

The HARM can cover a wide range of frequency spectra through the use of programmable digital processes in both the Megafortress avionics equipment and the missile. The missile operates in one of two modes:

Self-protect mode: the Megafortress warning receiver detects hostile emitters and programs the missile before launch. This is the default mode for the weapon.

Pre-brief mode: Missile is fired blind toward a possible target with the seeker searching in flight. The AGM-88A will attempt to locate and attack a radar emitting target. A self-destruction command is generated if no target is found.

AGM-88A HARM



Specifications

Range	46 miles	Weight	807 lb.
Warhead	150 lb. high explosive	Powerplant	Solid propellant rocket motor
		Speed	Supersonic
Guidance	Passive homing guidance system, homes on enemy radar emissions	Dimensions	length: 13 ft. 8.5 in. body diameter: 10 in. wing span: 3 ft. 8.5 in.

Operation: Within the missile's range,

Self-protect mode

1) Lock onto radar-emitting target, such as SAM or anti-aircraft (AAA) site.
2) Open bomb bay doors, if necessary.
3) Launch.
4) Close bomb bay doors.

Pre-briefed mode

1) Open bomb bay doors, if necessary.
2) Launch into general vicinity of suspected enemy radar (SAM or AAA) activity.
3) Close bomb bay doors.

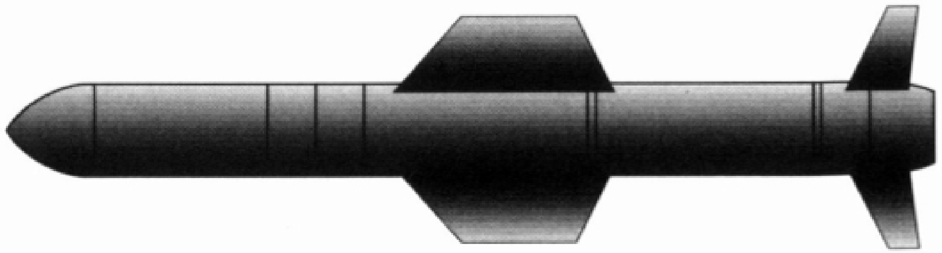
AGM-84A Harpoon

Role: The AGM-84A Harpoon gives the EB-52 a highly effective medium-range "standoff" capability against ships at sea, allowing it to attack targets from beyond the range of most return fire.

Description: The AGM-84A Harpoon missile is an all-weather, sea-skimming, "fire-and-forget" anti-ship missile. It can be launched from a variety of platforms, including the EB-52.

The missile flies in a cruciform configuration (i.e. with the wing in an "X" con-figuration rather than a " + " configuration) at high subsonic speeds with over-the-horizon ranges. The missile is capable of being launched from low or high altitudes, with engine start taking place automatically either before or after launch, depending on the Megafortress' altitude and airspeed.

AGM-84A Harpoon



Specifications

Range	57+ miles	Weight	1,145 lb.
Warhead	488 lb. penetration high explosive blast	Powerplant	Turbojet; 660 lb. thrust
		Speed	High subsonic
Guidance	Radar altimeter cruise, active radar terminal homing	Dimensions	length: 12 ft. 7.5 in. body diameter: 1 ft. 1.5 in. wing span: 3 ft.

Operation: Within the missile's range,

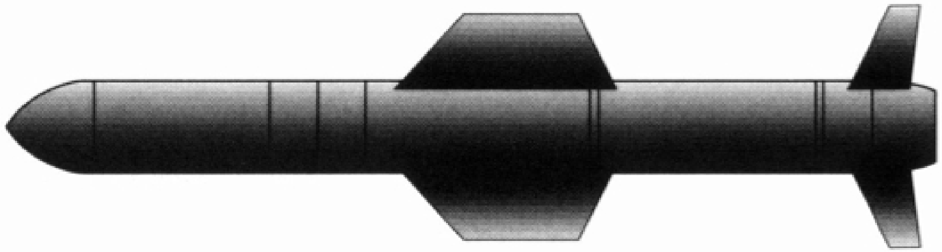
1) Lock onto target ship.
2) Open bomb bay doors, if necessary.
3) Launch weapon.
4) Close bomb bay doors.

AGM-84E SLAM (Standoff Land Attack Missile)

Role: The AGM-84E SLAM gives the EB-52 a highly effective medium-range "standoff" capability against ground targets such as buildings, bridges, and oil storage facilities.

Description: The AGM-84E SLAM missile is an all-weather, ground-skimming, "fire-and-forget" missile. The missile is about 25 in. longer and 200 lbs heavier than the AGM-84A anti-ship version and is designed for use against land-based targets.

AGM-84E SLAM (Standoff Land Attack Missile)



Specifications

Range	57+ miles	Weight	1,345 lb.
Warhead	488 lb. penetration high explosive blast	Powerplant	Turbojet; 660 lb. thrust
		Speed	High subsonic
Guidance	Terrain-following cruise monitored by radar altimeter, TV data uplink or active terminal radar homing.	Dimensions	length: 14 ft. 8.5 in. body diameter: 1 ft. 1.5 in. wing span: 3 ft.

Although its range and evasive characteristics improve on the AGM-142A "HaveNap" performance, the explosive charge is substantially smaller.

The missile flies in a cruciform configuration (i.e. with the wing in an "X" con-figuration rather than a " + " configuration) at high subsonic speeds with over-the-horizon ranges. The missile is capable of being launched from low or high altitudes, with engine start taking place automatically either before or after launch, depending on the Megafortress' altitude and airspeed.

Operation: Within the missile's range,

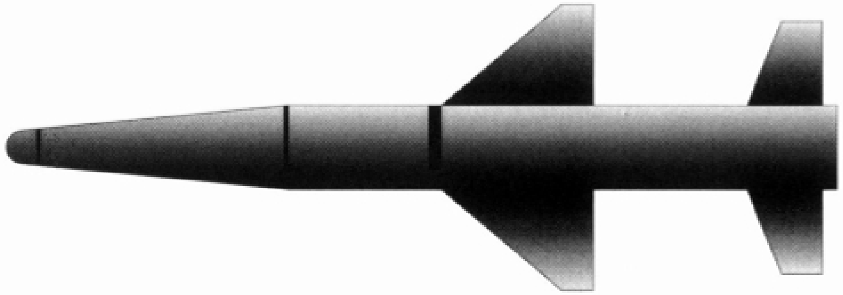
1) Lock onto ground-based target.
2) Open bomb bay doors, if necessary.
3) Launch weapon.
4) Close bomb bay doors.

AGM-142A Have Nap

Role: The AGM-142A provides Megafortress with a "standoff" strike capability, permitting the aircraft to deliver a heavy-duty, shaped high-explosive charge against hardened targets from beyond the reach of most close-in enemy SAM and anti-aircraft fire.

Description: Under the Have Nap program, the USAF acquired a quantity of Israeli-built Popeye medium-range TV-guided standoff missiles. Redesignated the AGM-142A Have Nap, the missile has approximately three times the explosive power and four times the range of the AGM-65G.

AGM-142A Have Nap



Specifications

Range	50 miles	Weight	3,000 lb.
Warhead	750 lb. high explosive	Powerplant	Solid propellant rocket motor
		Speed	594 mph
Guidance	Inertial, with TV homing	Dimensions	length: 18 ft. 8.5 in. body diameter: 1 ft. 9.5 in. wing span: 5 ft. 5 in.

Operation: Within the missile's range,

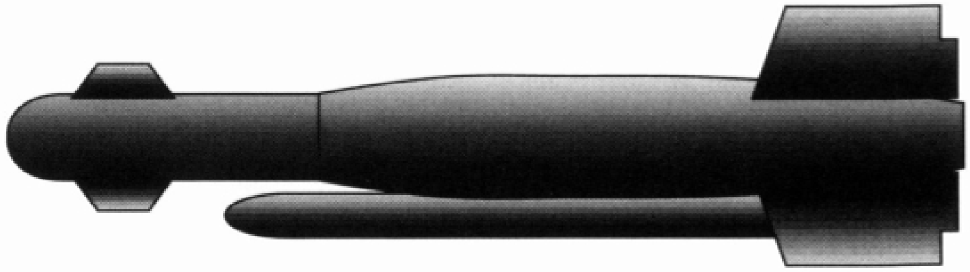
1) (Optional) Lock onto heat-generating ground target.
2) Open bomb bay doors, if necessary.
3) Launch weapon.
4) Switch camera mode from STV to GUIDANCE.
5) (Optional) Steer the weapon to its target by clicking on the camera direction arrows (use of the autopilot or TAC during this time is highly recommended).
6) Close bomb bay doors.

AGM-130 Striker

Role: The AGM-130 is the Megafortress' ultimate heavy weapon. It is designed to destroy the heavily defended targets that only Megafortress can reach.

Description: The AGM-130 is a rocket powered, cruciform-wing glide bomb fitted with a TV-imaging guidance system that allows it to be piloted remotely for pinpoint accuracy from low or medium altitudes over short standoff ranges. A variant of the GBU-15(V)2/B glide bomb, the AGM-130 is intended for tactical use to suppress enemy defenses and to destroy heavily defended targets.

AGM-130 Striker



Specifications

Range	20+ miles	Weight	3,000 lb.
Warhead	Mk 84 bomb (2,000 lb. high explosive)	Powerplant	Solid propellant rocket
		Speed	Subsonic
Guidance	TV or Imaging Infrared (IIR) seeker	Dimensions	length: 12 ft. 10.5 in. body diameter: 2 ft. 6 in. wing span: 4 ft. 11 in.

The weapon offers two modes of attack.

Direct mode: The weapon locks onto the target before launch and flies a near line-of-sight profile to impact.

Indirect mode: the seeker can be locked onto the target after launch, or the operator can fly the weapon manually to impact, using guidance updates provided through the data link. This mode uses a midcourse glide phase and extends standoff range.

Operation: Within the missile's range,

Direct mode

1) Lock onto heat-generating ground target.
2) Open bomb bay doors, if necessary.
3) Launch weapon.
4) Close bomb bay doors.

Indirect mode

1) (Optional) Lock onto heat-generating ground target.
2) Open bomb bay doors, if necessary.
3) Launch weapon.
4) Switch camera mode from STV to GUIDANCE.
5) Steer the weapon to its target by clicking on the camera direction arrows (use of the autopilot or TAC during this time is highly recommended).
6) Close bomb bay doors.

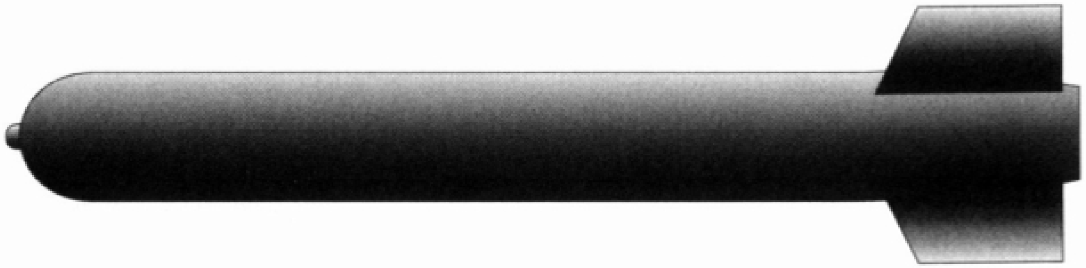
FREE-FALL ORDNANCE

Rockeye II

Role: The Rockeye II is designed to destroy a wide range of targets, including buildings, grounded airplanes, oil storage facilities, radar emitters, and missile sites. It is especially effective against targets that do not emit heat or radar signals.

Description: The Rockeye II combines a basic laser guided glide-bomb system with a 700 lb lb cluster bomb. The laser guidance system allows the EB-52 to release the weapon from farther away than allowable for a simple, unguided iron bomb.

Rockeye II



Specifications

Guidance	Laser guided	Weight	766 lb.
Warhead	High explosive cluster (MK 20 Rockeye)	Dimensions	length: 8 ft. 1 in. body diameter: 13.2 in.
Vertical Release Coordinate	12		

Its nose is fitted with a mechanical time fuse that initiates a charge approximately 100 ft above the ground, splitting the casing and dispensing over 240 bomblets acrossa broad area. Saturation area from a 500 ft. release is a 3,333 sq. yd oval.

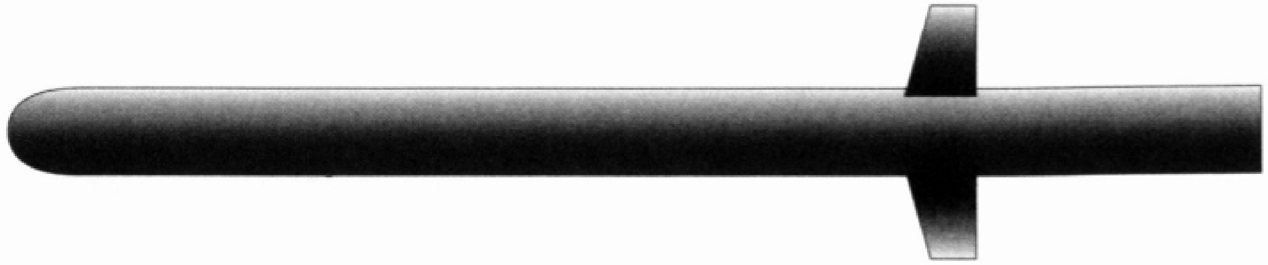
Operation: Within the weapon's range,

1) Lock onto target in CAMERA mode (preferably a non-heat- or radar-emitting target).
2) Open bomb bay doors, if necessary.
3) Steer the aircraft so that the horizontal POSITION coordinate in the CAMERA panel reaches zero (0). This means that the aircraft is on course directly toward the target.
4) Select LAUNCH. When the vertical coordinate reaches 12, the weapon's laser guidance system will launch the weapon automatically.
5) Close bomb bay doors.

Durandal

Role: When Megafortress is required to eliminate enemy airfields in order to achieve a mission's final objectives, the Durandal is a reliable tool. Accurate delivery of 2-3 Durandals will render an airfield inoperative for approximately one day.

Durandal



Specifications

Release Speed	Between 400 mph and 600 mph	Weight	483 lb.
Release Altitude	550-1,000 ft.	Warhead	High explosive penetrators
Vertical Release Coordinate	40	Dimensions	length: 8 ft. 6 in. body diameter: 8.78 in.

Description: Until the deployment of the DAACM, the French-made Durandal was the standard U.S. runway cratering device. Released at any speed between 400 and 600 mph, the Durandal is retarded by a double parachute, forcing its nose to drop. When an optimum no-ricochet penetration angle (-20° to -30°) is achieved, the parachutes are released and the bomb's rocket motor ignites. The weapon accelerates into the runway at a velocity of some 853 ft/second. Its forged-steel warhead penetrates up to 15.5 inches of concrete. After a delay of 1 second, a delayed fuse detonates the warhead, creating a crater 6.5 ft. deep and 16 feet wide, along with heave damage to a diameter of 23 ft.

Operation:

1) Use CAMERA mode to lock onto target (preferably a non-heat- or radar-emitting target).
2) Deactivate autopilot
3) Open the bomb bay doors, if necessary.
4) Turn on TAC and adjust its altitude for weapon delivery (550-1000 ft).
5) With the target selected in CAMERA mode, steer the aircraft so that the horizontal POSITION coordinate in the CAMERA panel reaches zero (0°). This means that the aircraft is on course directly toward the target.
6) Wait for the vertical POSITION coordinate in the CAMERA panel to reach 40°.
7) LAUNCH.
8) Close bomb bay doors.

Direct Airfield Attack Combined Munition (DAACM)

Role: The DAACM is a dual-role runway cratering device that both destroys runway surfaces and impedes repair work. When Megafortress is required to eliminate enemy airfields in order to achieve a mission's final objectives, the DAACM is the tool of choice .

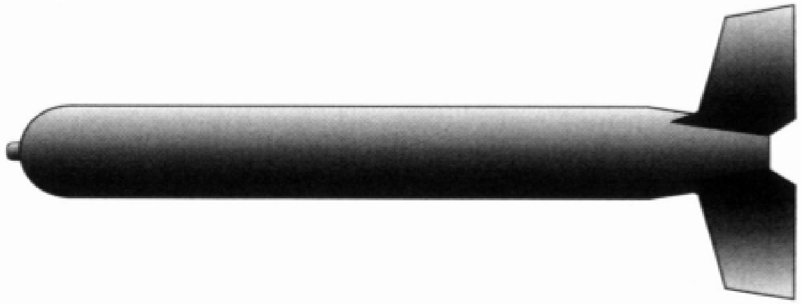
Description: The Avco DAACM has eight BLU-106/B boosted energy penetrators as its main payload for runway cratering, supported by 24 Hunting HB876 area-denial minelets to hamper repair work.

The BLU-16/Bs are dispensed at various velocities and parachute-retarder-opening delays into a designated pattern. As each is retarded and its nose drops 60° below the horizontal, it frees itself from its parachute and accelerates into the runway, driven by a solid-propellant rocket. This causes considerable crater and heave damage.

Operation: Within the weapon's range,

1) Use CAMERA mode to lock onto target (preferably a non-heat- or radar-emitting target).
2) Deactivate autopilot
3) Open the bomb bay doors, if necessary.
4) Turn on TAC and adjust its altitude for weapon delivery (550-1000 ft).
5) With the target selected in CAMERA mode, steer the aircraft so that the horizontal POSITION coordinate in the CAMERA panel reaches zero (0°). This means that the aircraft is on course directly toward the target.
6) Wait for the vertical POSITION coordinate in the CAMERA panel to reach 40°.
7) LAUNCH.
8) Close bomb bay doors.

Direct Airfield Attack Combined Munition (DAACM)



Specifications

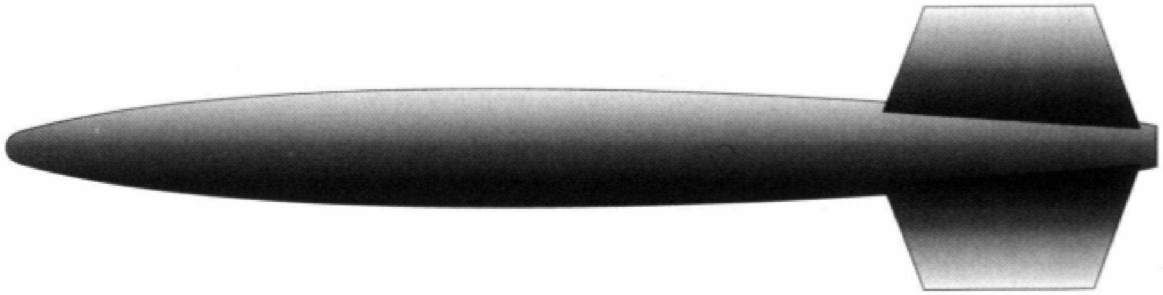
Release Speed	Between 400 mph and 600 mph	Weight	850 lb.
Release Altitude	550-1,000 ft.	Warhead	High explosive penetrators, area denial minelets
Vertical Release Coordinate	40	Dimensions	length: 9 ft 6 in. body diameter: 11.75 in.

MK-84 Low Drag General Purpose (LDGP)

Role: The MK-84 is a traditional free falling "iron bomb," and is used against exposed buildings, such as control towers, hangars, and heavy equipment, and against runways.

Description: This is the only traditional single charge iron bomb in the EB-52 arsenal. Don't be misled by the simplicity of its design. The weapon can be delivered from very high altitudes, and the size and explosive power of its charge is sufficient to level a large building complex.

MK-84 Low Drag General Purpose (LDGP)



Specifications

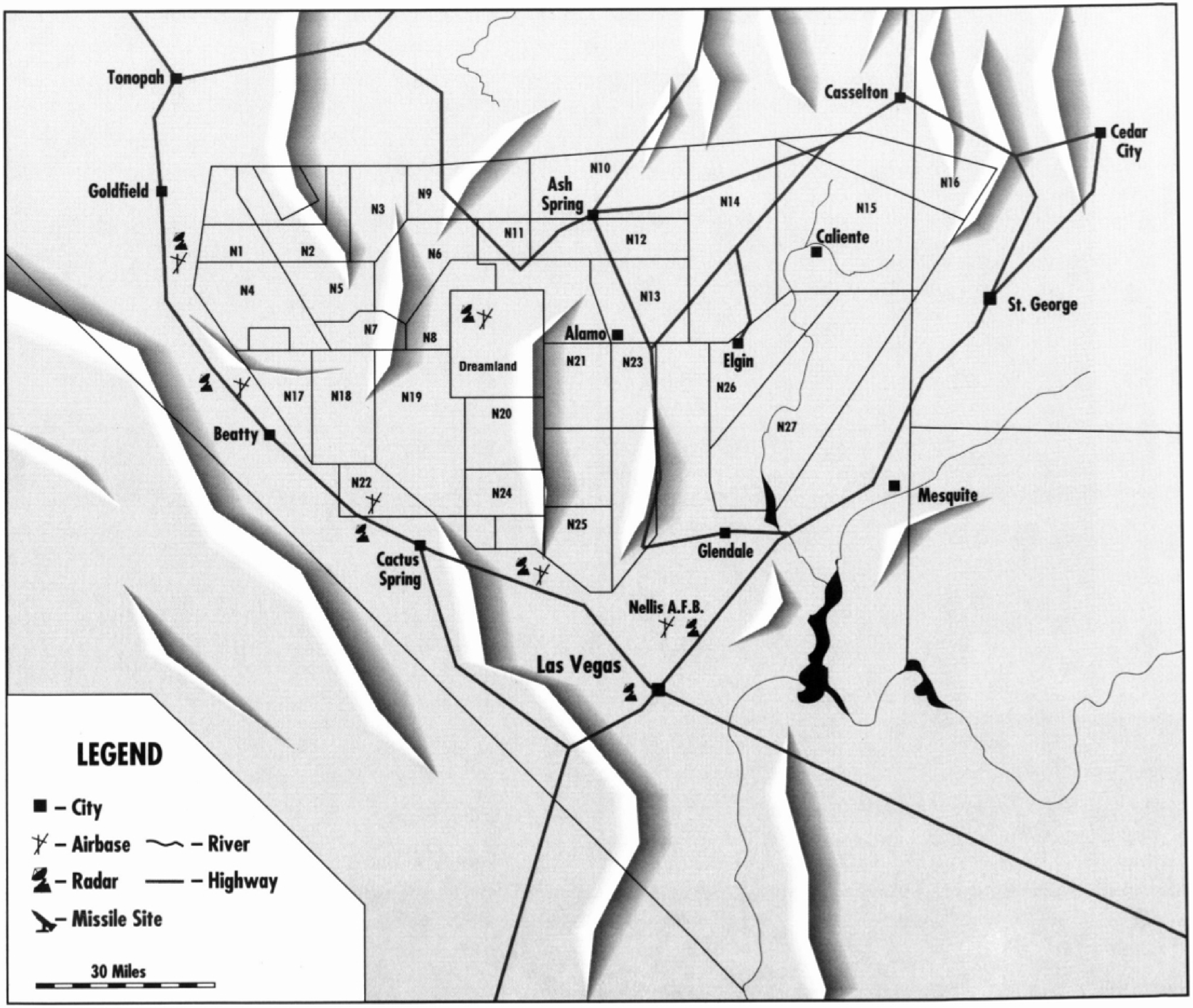
Release Speed	400-600 kts.	Weight	2,000 lb.
Release Altitude	Minimum 1,000 ft.	Warhead	High explosive, self arming at 1,000 ft.
Vertical Release Coordinate	12	Dimensions	length: 6 ft. 10 in. body diameter: 24 in.

Operation:

1) Use CAMERA mode to lock onto target (preferably a non-heat- or radar-emitting target).
2) Deactivate autopilot
3) Open the bomb bay doors, if necessary.
4) With the target selected in CAMERA mode, steer the aircraft so that the horizontal POSITION coordinate in the CAMERA panel reaches zero (0°). This means that the aircraft is on course directly toward the target.
5) Wait for the vertical POSITION coordinate in the CAMERA panel to reach 12°.
6) LAUNCH.
7) Close bomb bay doors, if necessary.

AIR MINES

Originally, the tail of the B-52 was armed with four rear-directed 50-caliber gatling-type machine guns as a defense against rear-quarter attack by enemy fighters. In the EB-52, these are replaced with an enclosed cannon that fires 12-inch flak canister rockets. The AN/AAQ-12 RLIR tracks both rocket and fighter, transmittting steering signals to the rockets. When the distance between the fighter and the rocket decreases to less than 200 yards, the fire-control computer detonates the rocket. The RLIR has a detection range of 30 miles; rockets have a range of 2 miles. Total magazine load is 30 rockets.


Tonopah
Goldfield
Casselton
Cedar City
Ash Spring
N1
N2
N3
N4
N5
N6
N7
N8
N9
N10
N11
N12
N13
N14
N15
N16
N17
N18
N19
N20
N21
N22
N23
N24
N25
N26
N27
Caliente
St. George
Dreamland
Alamo
Elgin
Beatty
Mesquite
Glendale
Cactus Spring
Nellis A.F.B.
Las Vegas
LEGEND
■ – City
– Airbase
– River
– Radar
– Highway
– Missile Site
30 Miles

6 MISSIONS

There are 31 mission flight plans on file in Megafortress' memory banks. Three geographic theaters are involved: the Red Flag training area north of Las Vegas, Nevada; the countries northwest of the Persian Gulf; and the Kamchatka penisula of the eastern Soviet Union. A map of each plan is included in a separate booklet accompanying this manual.

RED FLAG

In order to train crews to handle the EB-52 Megafortress successfully in combat, provision has been made to use the Nellis AFB bombing ranges in southern Nevada. These are the ranges used during the "Red Flag" training exercises conducted by the 4440th Tactical Fighter Training Group (TFTG or "Red Flag") of the USAF.

It is highly recommended that crews take the time to fly each Red Flag training mission before venturing into the Persian Gulf or "Flight of the Old Dog" scenarios. The skills developed here will spare you hours of frustration later.

The TFTG has no aircraft of its own, no ranges, and few personnel. The TFTG is one small part of the Tactical Fighter Weapons Center (TFWC), located at Nellis.

The TFTG develops and schedules five "Red Flag" air combat and support exercises per year, involving a number of Tactical Fighter Weapons Center (TFWC) units in each exercise. Although it is a small group in and of itself, the 4440th has operational control of a tremendous number of resourceswhen there's a Red Flag going on. These resources include:

The 554th Operations Support Wing: To Red Flag, the most important section of the 554th is the Range Group, charged with maintaining and operating the vast bombing ranges north of Nellis.

The Adversary Tactics Directorate: The ATD is the parent unit of Nellis' two Aggressor Squadrons, the 64th and 65th AS. The Aggressors fly camouflaged F-5Es, simulating late-model MiG threat aircraft (please see Appendix 1, "Enemy Aircraft"). The ATD also conducts training programs for new Aggressor pilots and radar operators.

4513th Adversary Threat Training Group: The 4513th is theintelligence unit of the 57th Fighter Weapons Wing (FWW). The Aggressors get most of their up-to-date tactics and briefing information from the 4513th. The ATTG also helps develop the Red Flag scenarios.

Red Flag Missions

1 Flight Procedures

This mission exercises the crew's ability to handle some of the basic procedures outlined in Chapter 2, "Flight Procedures": takeoff, aircraft identification, flight control, and landing. No ordnance is loaded, and more than enough fuel is provided for the entire mission.

The mission begins at the pilot station, with the aircraft positioned at the end of the runway. Follow the takeoff procedures detailed in Chapter 2 to get the aircraft up and flying, and turn on the autopilot (FCS—see Chapter 1, "Multi-Station Instruments") when the aircraft reaches an altitude of 1000+ feet.

The aircraft flies to the first waypoint, where Air Traffic Control (ATC) requests identification. (Identification using the copilot's IFF Transponder is described in Chapter 2.) The aircraft then proceeds to the second waypoint.

During the remainder of the flight, controls in the pilot and copilot stations should be explored. The following are suggested exercises:

- Use the clock "ETA" function to check time to next waypoint.
- Override the autopilot by using the keyboard
- Fly without using the autopilot.
- Fly using the TAC (see chapter 1, "Pilot Station"). Experiment with different height settings.
- Override the TAC using the keyboard.
- Change the power settings of individual engine throttles and observe the effect on aircraft performance.
- Turn off an engine and restart it in flight. (see Chapter 2, "Flight Procedures," or the PROCEDURAL monitor in the copilot station.)
- Test the airbrakes and landing gear as speed controls.
- Compare fuel consumption at very high and very low altitudes.
- Experiment with the external camera. Check the condition of navigation lights and landing gear compared to their controlling switches at the copilot and pilot stations. (see Chapter 1, "External Camera.")
- Practice using the keyboard "Hot Keys." (See "Installation & Reference Guide.")

Finally, with the autopilot turned on, the aircraft returns to the third waypoint (Nellis AFB), and is cleared to land. Landing procedures are detailed in Chapter 2.

2 Navigation

This mission will familiarize the crew with the navigation systems aboard the EB-52. The mission begins in the same way as Mission 1 above with the standard takeoff and identification procedures. After identification is made, make sure that the autopilot is turned on and proceed to the navigator's station.

As described in Chapter 1, the Navigator Station has five modes. Read "Navigator Station" carefully, and then experiment with each mode in the following ways:

Map Mode

- With the FCS set to DISPLAY, use the small monitor to find information about time and distance to various waypoints.
- With the FCS set to EDIT, use the small and large monitors to edit and restore waypoints.
- With the WAYPOINT switch turned OFF, use the small monitor to display data about selected points on the large monitor.

Radar Mode

- Experiment with the range settings.
- Compare the high-resolution radar image in the large monitor with the low-resolution "TAC" image in the small monitor.
- Experiment with temporary waypoints following the directions in "Navigator Station," Chapter 1. It is possible to fly the aircraft exclusively from the Nav station—at low altitudes, through mountains, etc.—by using temporary waypoints.

STV Mode

- Use the ADJUST switch to practice looking in one direction while flying in another.

3 Radar Evasion

The goal of this mission is simply to fly from the first to the third waypoint without allowing the search radars to track you.

Although it is possible to move the waypoints and avoid the radars altogether, or to jam every radar encountered, the idea is to learn how to evade radars when necessary.

The mission begins in the same way as Mission 1 above with the standard takeoff and identification procedures. After identification is made, try these techniques:

- Determine the effects of altitude on detection. Remember, the EB-52 can "see" a search radar long before being seen, or tracked, itself.
- Attempt to thread the aircraft flight path through the radars, skimming the ranges at which it is likely to be detected.
- When evasion fails, jam the search radar signal from the EW station.

These skills are required for successful completion of any mission. Remember: the name of the game is EVASION.

4 Inflight Refueling

In this mission the pilot and copilot maneuver the aircraft through typical inflight refueling and identification procedures. The Persian Gulf and Kamchatka missions require accomplishment of both procedures.

- During inflight refueling, use the external camera to observe the rendezvous. Use the TARGET view to watch from the tanker aircraft's point of view.

5 1 MiG Evasion

Evading a MiG requires different tactics from those employed in shooting one down. Because MiGs are usually directed, or "vectored" to locations by Ground Control Intercept (GCI) facilities (enemy radar stations), the best way to evade them is to evade enemy radars. In this mission, the goal is to lose a MiG that has been vectored to the EB-52's location.

The difficult part of the task is knowing when the MiG is out there. Since, like the EB-52, they generally fly with their passive radars running so as to avoid announcing their presence, it is necessary to turn the ATTACK active radar at the OW station on for brief periods to try to "paint" any enemy fighter that might be nearby.

To lose an enemy fighter there are only a few things a bomber can do.

- Fly low and toward a mountain or some other part of the terrain, trying to lose the aircraft's radar image against the larger object.
- Turn off all external lights.
- Make sure ATTACK radar is OFF.
- Turn and try to lose him.

A few observations:

- All enemy fighters use the same general technique: they pull in above and behind the EB-52, about 25 miles out. Then they fire a pair of radar-guided missiles. If those miss they move in closer and fire a couple of IR-guided missiles. If they miss again they probably will have enough fuel left to try a pass with their guns. If they still have fuel they may make a circle and one more gun pass before giving up and heading back to base.
- Enemy fighters prefer visual sightings, avoiding use of their attack radars unless absolutely necessary. But if they lose visual contact they may be forced to turn on their radars and reveal their locations.
- If the EB-52 is being tailed by a MiG, make sure the EW station's rear-looking infrared (RLIR) scanner is ON, and the AUTO CHAFF and AUTO FLARES switches turned ON.
- If the EW Officer is fast and manages to pick up an enemy missile on the radar, it is possible to jam its guidance system with either the JAM SIGNAL or JAM IR buttons, depending on the type of missile fired. Of course, this makes it easier for the MiG to locate the aircraft.
- Finally, it is possible to turn out of the missile's way—depending on the speed and maneuverability of the missile.

6 2 MiG Evasion

If one enemy fighter is easy to evade, try two.

7 2 MiG Defense

If it becomes impossible to evade an enemy fighter, the crew will need to blow him out of the sky. But remember: the ultimate mission is one in which the enemy never sees the EB-52—just a trail of wrecked installations and equipment. This mission lets the crew practice mounting an active defense against two MiGs, using air-to-air missiles, air mines, chaff, and flares.

- Load the EB-52 with AIM-120C and AIM-9R missiles (see "Loadout Screen," Chapter 2, "Loadout," Chapter 3, and "Ordnance," Chapter 5).
- Use the same tactics described in "1 MiG Evasion" above to counter the fighters' moves.
- See "OW Station" in Chapter 1 to learn how to launch missiles and air mines against the enemy.

8 3 MiG Defense

If two enemy fighters are easy to shoot down, try three.

9 Unopposed Bombing - 1

This mission provides the crew with an opportunity to practice bombing runs, without any interference from the enemy. The aircraft is pre-loaded with an assortment of ordnance, but requires fueling before takeoff (see "Loadout Screen," Chapter 2, "Loadout," Chapter 3, and "Ordnance," Chapter 5).

Read "OW Station," Chapter 1, and "Bombing Run," Chapter 3, to prepare for this mission.

10 Unopposed Bombing - 2

This mission provides the crew with an opportunity to practice bombing runs, without being intercepted by MiGs, surface-to-air missiles (SAMs), or anti-aircraft artillery (AAA). Enemy search radars will be on the lookout for the EB-52.

The aircraft is pre-loaded wih an assortment of ordnance, but requires fueling before takeoff (see "Loadout Screen," Chapter 2, "Loadout," Chapter 3, and "Ordnance," Chapter 5).

Read "OW Station," Chapter 1, and "Bombing Run," Chapter 3, and practice radar evasion to prepare for this mission.

11 Unopposed Bombing - 3

This mission provides the crew with an opportunity to practice bombing runs, without being intercepted by MiGs, surface-to-air missiles (SAMs), or anti-aircraft artillery (AAA). Enemy search and SAM radars will be on the lookout for the EB-52.

The aircraft is pre-loaded wih an assortment of ordnance, but requires fueling before takeoff (see "Loadout Screen," Chapter 2, "Loadout," Chapter 3, and "Ordnance," Chapter 5).

Read "OW Station," Chapter 1, and "Bombing Run," Chapter 3, and practice radar evasion to prepare for this mission.

12 Bombing - 1

This mission provides the crew with an opportunity to practice bombing runs, without being intercepted by surface-to-air missiles (SAMs), or anti-aircraft artillery (AAA). Enemy MiGs will be on the lookout for the EB-52.

The aircraft is pre-loaded wih an assortment of ordnance, but requires fueling before takeoff (see "Loadout Screen," Chapter 2, "Loadout," Chapter 3, and "Ordnance," Chapter 5).

Read "OW Station," Chapter 1, and "Bombing Run," Chapter 3, and practice evasion to prepare for this mission.

13 Bombing - 2

This mission provides the crew with an opportunity to practice bombing runs under fire. Enemy MiGs, search radars, and SAM sites will be on the lookout for the EB-52.

The aircraft is pre-loaded wih an assortment of ordnance, but requires fueling before takeoff (see "Loadout Screen," Chapter 2, "Loadout," Chapter 3, and "Ordnance," Chapter 5).

Read "OW Station," Chapter 1, and "Bombing Run," Chapter 3, and practice radar and MiG evasion to prepare for this mission.

14 Full Bombing - 1

This mission provides the crew with an opportunity to practice bombing runs fully armed and under fire. Enemy MiGs, search radars, and SAM sites will be on the lookout for the EB-52. The target runway is located at the 2nd waypoint.

The aircraft is pre-loaded wih an assortment of ordnance, but requires fueling before takeoff (see "Loadout Screen," Chapter 2, "Loadout," Chapter 3, and "Ordnance," Chapter 5).

Read "OW Station," Chapter 1, and "Bombing Run," Chapter 3, and practice radar and MiG evasion to prepare for this mission.

15 Full Bombing - 2

This mission provides the crew with an opportunity to practice bombing runs fully armed and under fire. Enemy MiGs, search radars, and SAM sites will be on the lookout for the EB-52. The target runway is located at the 3rd waypoint, requiring more evasion along the way than in Full Bombing - 1.

The aircraft is pre-loaded wih an assortment of ordnance, but requires fueling before takeoff (see "Loadout Screen," Chapter 2, "Loadout," Chapter 3, and "Ordnance," Chapter 5).

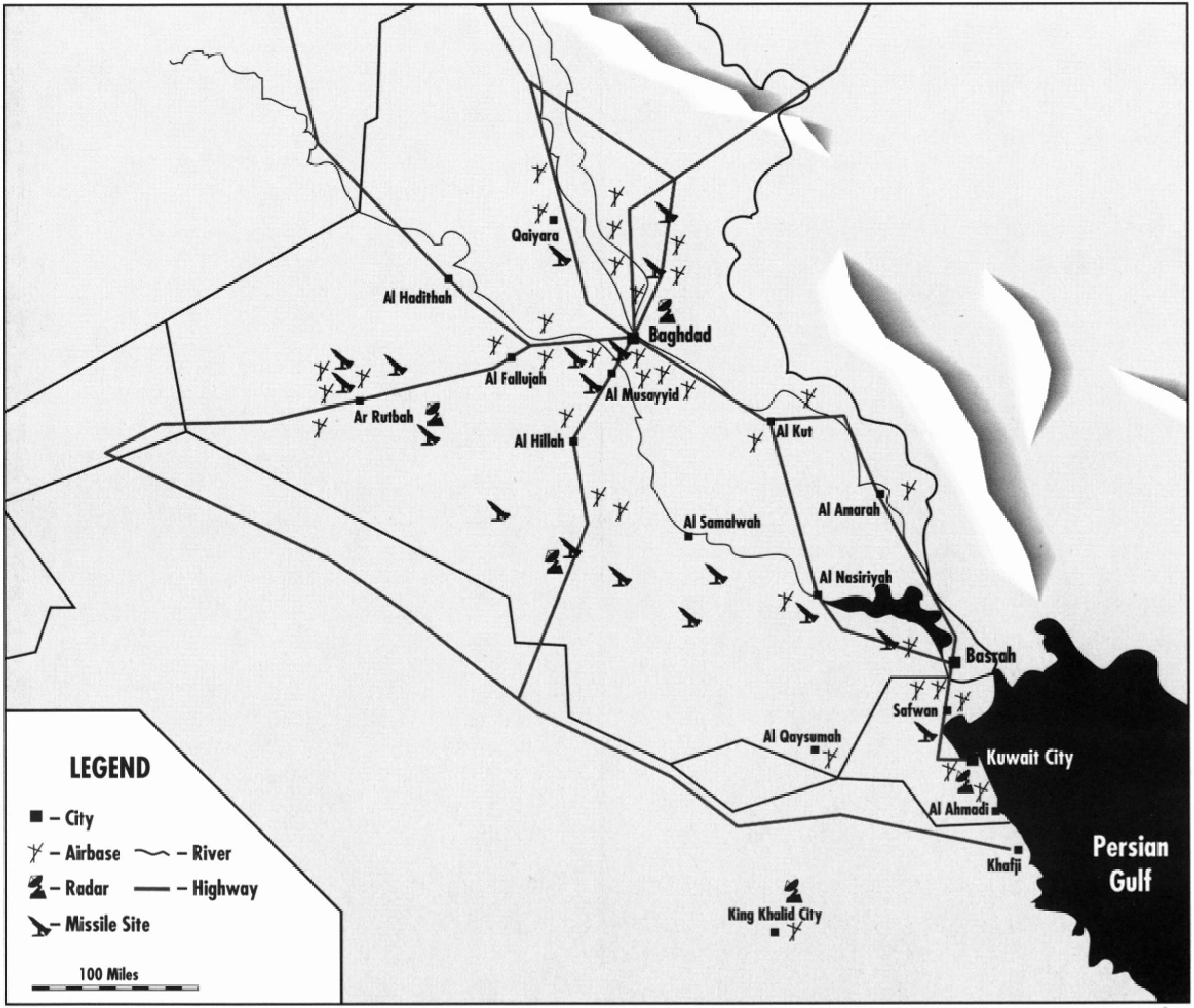
Read "OW Station," Chapter 1, and "Bombing Run," Chapter 3, and practice radar and MiG evasion to prepare for this mission.

16 Multiple Targets

This mission provides three targets instead of one, as in the other practice bombing runs. The EB-52 is fully armed and under fire. Enemy MiGs, search radars, and SAM sites will be on the lookout for the EB-52.

The aircraft is pre-loaded with an assortment of ordnance, but requires fueling before takeoff (see "Loadout Screen," Chapter 2, "Loadout," Chapter 3, and "Ordnance," Chapter 5).

Read "OW Station," Chapter 1, and "Bombing Run," Chapter 3, and practice radar and MiG evasion to prepare for this mission.


Qaiyara
Al Hadithah
Baghdad
Al Fallujah
Al Musayyid
Ar Rutbah
Al Hillah
Al Kut
Al Amarah
Al Samalwah
Al Nasiriyah
Basrah
Safwan
Al Qaysumah
Kuwait City
Al Ahmadi
Khafji
Persian Gulf
King Khalid City
LEGEND
■ – City
– Airbase
– River
– Radar
– Highway
– Missile Site
100 Miles

PERSIAN GULF

By 1990, Iraq had the sixth largest military force in the whole world, with a reported 750,000 soldiers, 1,400 combat aircraft, 3,000 anti-aircraft weapons, and 6,000 armored combat vehicles. Iraq also commanded a very sophisticated command and control network that tied all of these weapons together over an expanse of territory roughly the size of California.

The 14 missions in Iraq and Kuwait follow Megafortress on a step-by-step campaign designed to neutralize the Iraqi war machine.

The Megafortress arrived secretly by ship in the region shortly after Christmas, 1990. With the B-1B bombers grounded due to congressional inquiries and debates over safety, cost-cutting, military spending, the "peace dividend," etc, the EB-52's stealth capabilities and payload size make it a logical candidate to follow the F-117As into Iraq.

Megafortress begins working for the coalition by destroying a key fighter air base in northwest Iraq, and eliminating key command and communication centers. The Iraqis, trained by their eastern-bloc arms dealers, rely on the Soviet system of early warning-ground control intercept (EW-GCI) targeting. Ground-based radar controllers provide fighters with the coordinates of intruders, "vectoring" the fighters to locations "of interest." Pilots are not trained to work independently of the system, as are the coalition pilots trained at Red Flag. When the centralized control centers for this GCI system are destroyed, the Iraqi Air Defense Network is effectively blinded.

Next, munitions supply facilities and a chemical weapons plant must be destroyed to prevent resupply of the Iraqi army in Kuwait. Mobile SCUD launchers located near the chemical plant are also hit by the Megafortress.

The war broadens, and coalition F-16s and Tornados begin to raid southern Iraq. But crews are forced by cautious commanders to dodge a critical Iraqi air base. Megafortress is detailed to deliver a single devastating strike and eliminate the distraction. Iraq's primary communications center, the International Communications Center (ICC) in Baghdad, is hammered next by the big bomber, along with the main power source for the capital city. The Iraqis are cut off from the rest of the world.

The Republican Guard forces in Kuwait are the finest troops in Iraq's army and must be neutralized before the country can be retaken. With its command center in southern Iraq shut down, the Guard itself can be attacked without an unreasonable loss of life. Power-generating facilities and transportation systems in the area are also destroyed.

The southeastern approaches to Baghdad are heavily guarded by enemy fighter aircraft, and must be dealt with in order to reach the industrial areas housing Iraqi biological weapons production.

Although the exact biological agents being produced are unknown, their potential as weapons of war is far more diabolical even than that of chemical weapons.

With Iraqi command and control centers, communications systems, power sources, munition supply centers and central air defense bases under control in central Iraq, the Megafortress turns its attention southward, toward Kuwait. A major Kuwaiti air base captured by the invading Iraqis is hit, and the Iraqi stronghold surrounding Basrah begins to feel the big bomber's iron fist pounding at the door. Basrah is the main Iraqi citadel on Kuwait's borders, and holds many of the keys to unlocking Iraq's stranglehold on its rich southern neighbor. Air bases and the main supply routes into Kuwait are hit, and Iraq's budding nuclear weapons capability is damaged.

Coalition commanders follow through on the nuclear plant attack by using the Megafortress to strike north again, smashing an enriched uranium production facility outside of Baghdad.

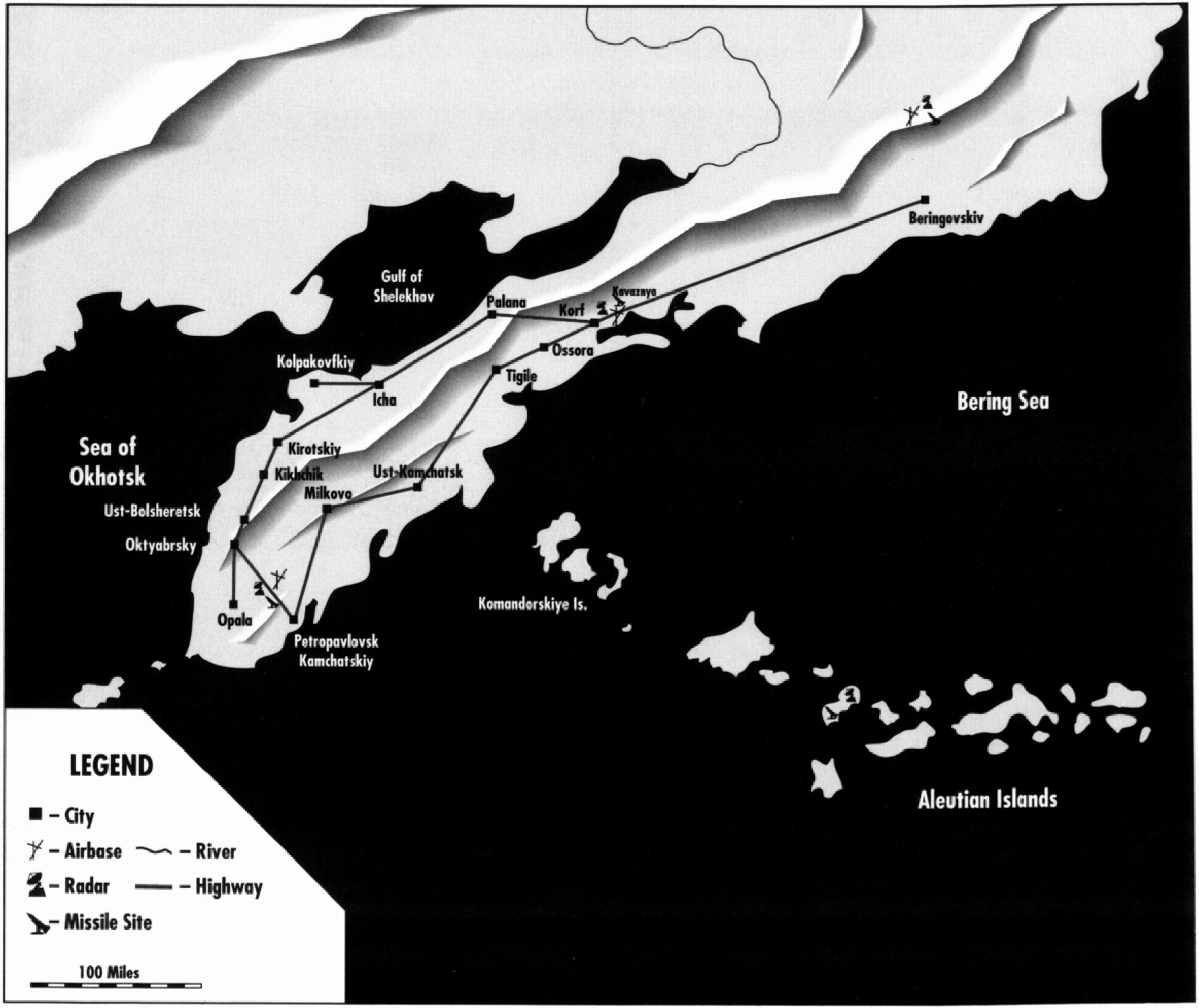
As the Iraqi leaders face the truth—in private—about their situation, the Megafortress is detailed to destroy the primary transportation facility in Baghdad. Saddam/Baghdad International airport and its support facilities are leveled. The military leadership is denied all but the most primitive means of escape.

Megafortress is now sent to destroy the Iraq army's heavily-fortified central command complex in Baghdad. With its central command structure smashed, the remaining Iraqi forces in Kuwait are completely cut off.

In its final missions, Megafortress destroys the remnants of Iraq's once-proud air force, and closes the enemy's remaining supply routes into Kuwait in preparation for the ground assault. Finally, it shuts down Kuwait International Airport. The Iraqis are defeated, and the Megafortress once again slips away into the shadows of the USAF's top-secret weapons programs.

NOTE

Mission details for the Persian Gulf and Flight of the Old Dog are classified, and will be available only during mission assignment or the mission itself.


Gulf of
Shelekhov
Palana
Korf
Kavaznya
Ossora
Tigile
Kolpakovfkiy
Icha
Beringovskiv
Bering Sea
Sea of
Okhotsk
Kirotskiy
Kikhchik
Ust-Kamchatsk
Milkovo
Ust-Bolsheretsk
Oktyabrsky
Opala
Petropavlovsk
Kamchatskiy
Komandorskiye Is.
Aleutian Islands
LEGEND
■ – City
– Airbase
– River
– Radar
– Highway
– Missile Site
100 Miles

FLIGHT OF THE OLD DOG

It was never expected that the first EB-52 should actually see combat service or that it would prove so effective. Originally used as a testbed for stealth modifications destined for the B-1 bomber, the stripped-down 25-year-old B-52H was rebuilt piece by piece using state-of-the-art radar-defeating composite materials, components, and design techniques.

The engineers at Dreamland (the USAF's top-secret test facility near Nellis Air Force Base) knew that the B-52's size and signal-generating abilities made it a difficult aircraft to hide, but since their object was research rather than combat effectiveness, the "Old Dog" proved a much less expensive way of testing materials and design theories than by sacrificing one of the extremely controversial and expensive B-1s.

However, in 1987, prior to the disintegration of the communist governments in Eastern Europe and the Soviet Union, the Soviets began to use a heavily defended ground-based laser in Kavaznya on the Kamchatka peninsula in the eastern Soviet Union to strike western reconnaissance satellites and aircraft. The western powers felt the ever-precarious balance-of-power tilt as their electronic eyes were systematically blinded.

A series of unforseen circumstances forced the USAF to rely on the Old Dog to eliminate the massive laser. The entire story was reported in Dale "Bear" Brown's completely unauthorized book, *Flight of the Old Dog*, and need not be repeated here.

Instead, curious EB-52 crews are invited to attempt to reenact the EB-52's first combat mission. Knowledge of the original story, as described in Capt. Brown's book, will be extremely helpful. Limited assistance is provided throughout the mission by mission commander General Elliot, but crews will need to exercise initiative, as well as what they've learned in the Red Flag and Persian Gulf missions, to succeed. (Gen. Elliot's comments appear in the Message Display Line ("please see "Stations: Multi-Station Instruments," Chapter 1), but can be bypassed quickly by tapping the space bar.)

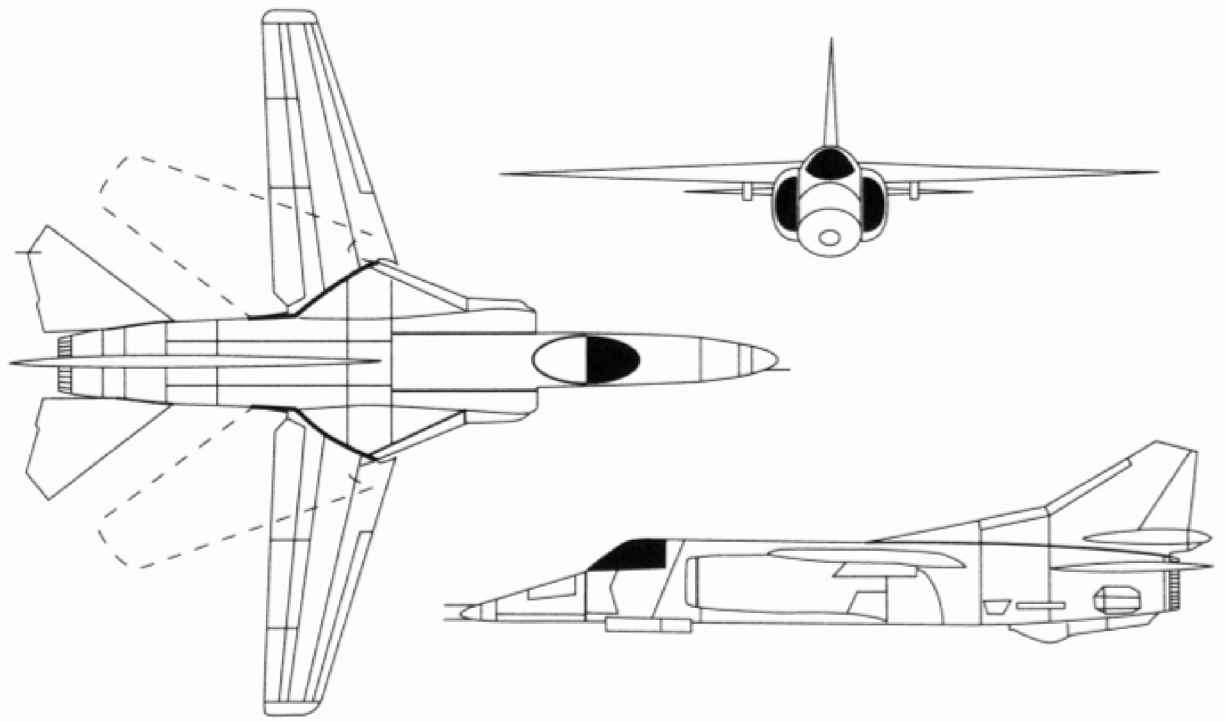
Beyond this basic information, we cannot assist crews further except with best wishes for a successful mission. The future of the free world is in your hands.

APPENDIX 1: ENEMY FIGHTERS

MIG-27 Flogger-J

The MiG-27 has the same basic power plant as the Soviet air forces MiG-23MF, but with a two-position (on/off) afterburner nozzle and fixed engine air intakes. This is consistent with the the Flogger's primary requirement of transonic speed at low altitude. The version employed against Megafortress is the Flogger-J, first identified in 1981. It has enhanced electro-optical sensors, probably with rearward laser designation capability for laser-guided bomb delivery. The MiG-27's armament includes two gun pods on underwing pylons, with gun barrels that can be depressed for attacking ground targets.

MIG-27 Flogger-J

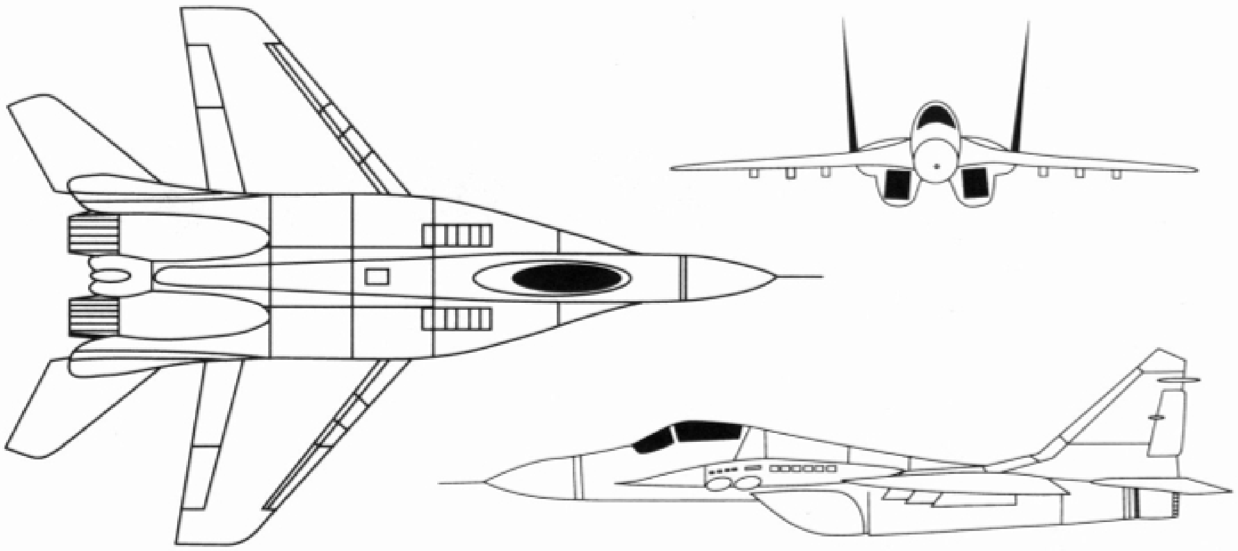


Missiles: AA-7, AA-8, AA-9, AA-11

MiG-29 Fulcrum

The MiG-29 twin-engine combat aircraft is comparable in size to the Navy's F/A-18 Hornet. Its pulse-Doppler "look-down shoot-down" radar is limited to search-while-scan rather than track-while-scan, but is supplemented by a laser range finder and an infrared search/track sensor in front of the windscreen. Operating in conjunction with a helmet-mounted aiming device, these enable the MiG to avoid emission of detectable radar signals when approaching targets. Sustained turn rate is much improved over earlier Soviet fighters.

MIG-29 Fulcrum



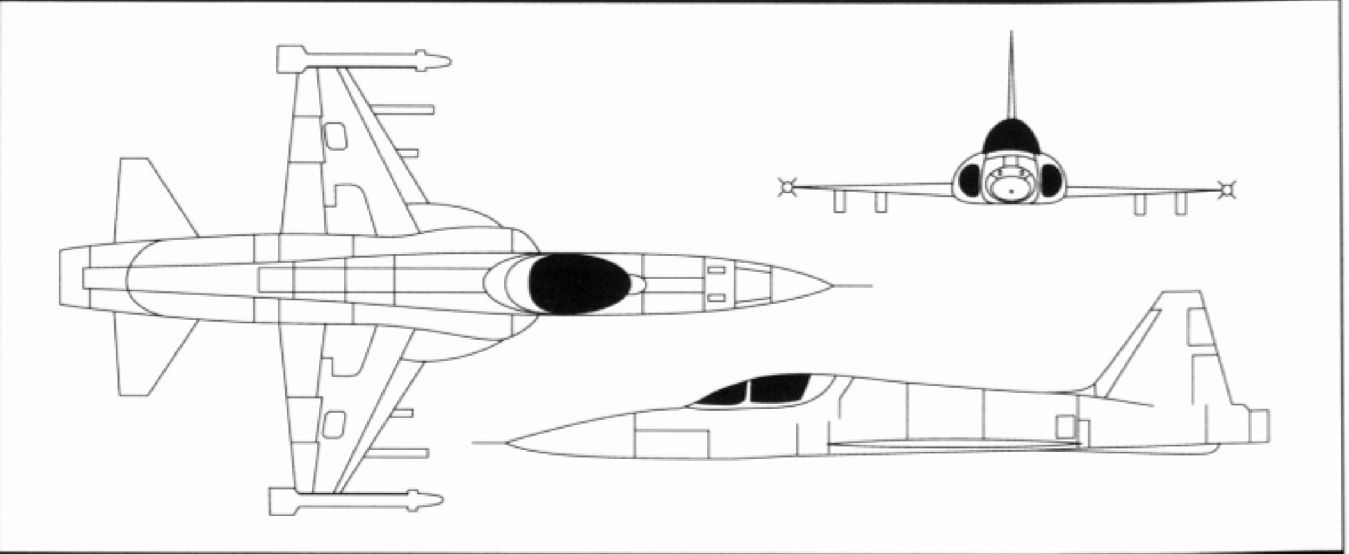
Missiles: AA-8, AA-9, AA-10, AA-11

F-5E/F Tiger II

The single seat F-5E, first flown in August 1972, is basically a VFR day/night fighter with limited all-weather capability. Design emphasis is on maneuverability rather than high speed, notably through the use of maneuvering flaps.

Two "aggressor squadrons" of camouflaged F-5Es simulate late-model MiG threat aircraft in the "Red Flag" missions. During the missions, the aircraft is identified as a MiG on the EB-52 radar scopes.

F-5E Tiger II



Missiles: AIM-120C, AIM-9R

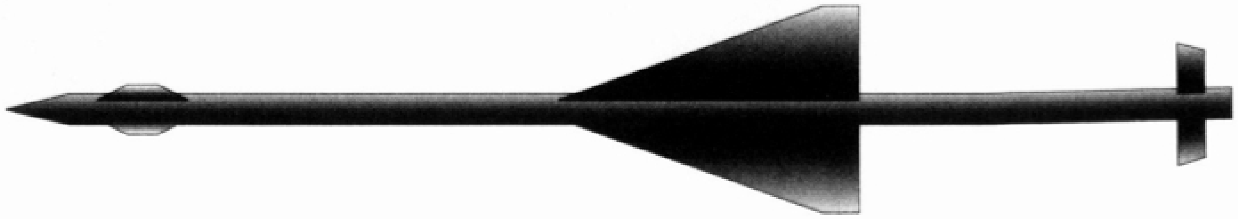
APPENDIX 2: ENEMY ORDNANCE

AIR-TO-AIR MISSILES

AA-7 Apex

Carried by both MiG-27s and MiG 25s, only the radar homing version of the Apex has been observed in use by Iraq.

AA-7 Apex



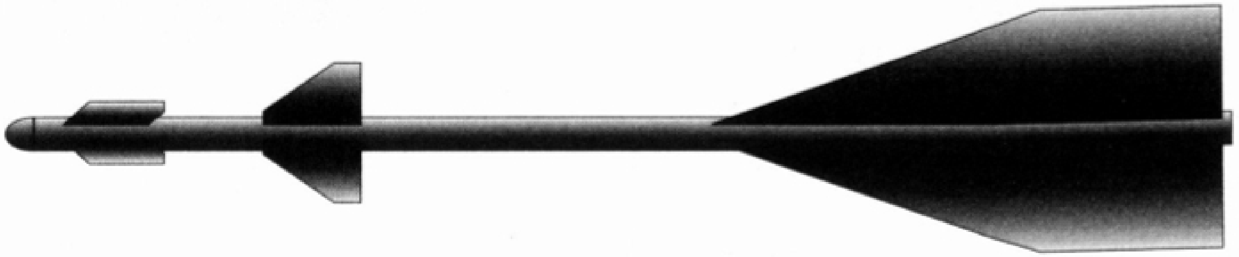
Specifications

Guidance	Infrared or semiactive radar homing	Range	12.5 miles
Warhead	66 lb. high explosive		

AA-8 Aphid

This highly maneuverable close-range missile is carried by late-model MiG-27s and MiG 29s.

AA-8 Aphid



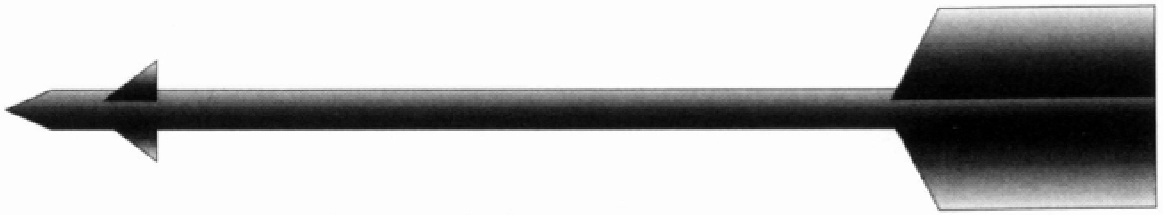
Specifications

Guidance	Infrared homing	Range	3-5 miles
Warhead	13.2 lb. high explosive		

AA-10 Alamo-A

The Alamo-A is standard equipment on the MiG-29. In its original radar homing variant it is a fairly effective medium-range dogfighting weapon.

AA-10 Alamo-A



Specifications

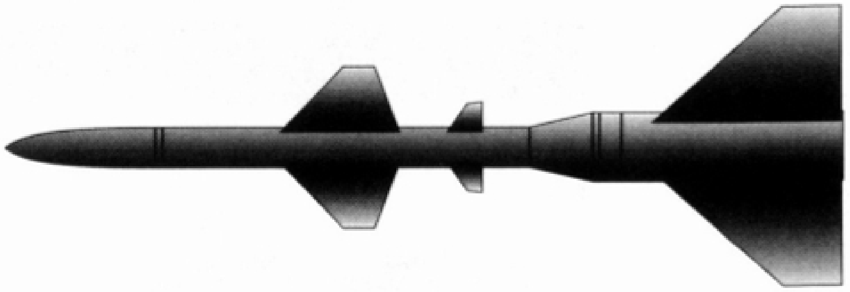
Guidance	Semiactive radar homing	Range	5-6 miles
Warhead	Approximately 34 lb. high explosive		

SURFACE-TO-AIR MISSILES (SAM)

SA-2 Guideline

This land-transportable SAM has undergone considerable upgrading since its introduction in 1959. It has largely been replaced in the Soviet Union, but still sees frontline duty in over 20 countries, including Iraq.

SA-2 Guideline



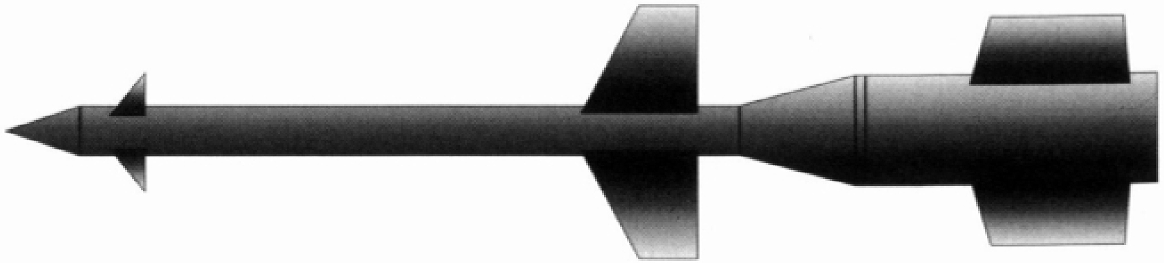
Specifications

Guidance	Automatic radio command, with radar tracking of target	Range	31 miles (slant)
Warhead	288 lb. high explosive		

SA-3 Goa

The SA-3 is a mobile low-altitude SAM configured to two-, three-, and four-round launchers.

SA-3 Goa



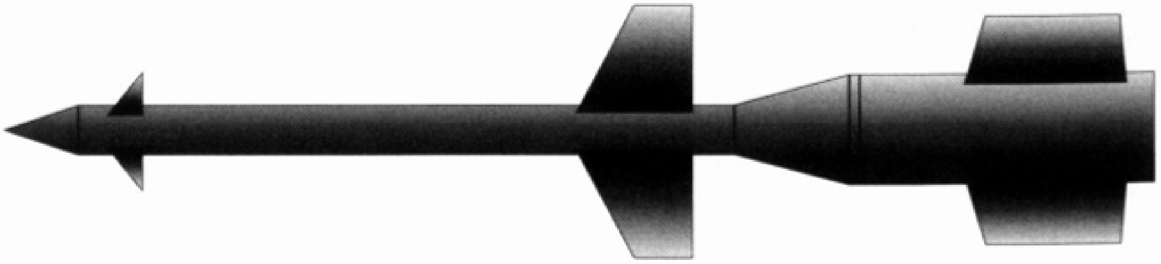
Specifications

Guidance	Automatic radio command, with radar terminal homing	Range	15-18.5 miles (slant)
Warhead	132 lb. high explosive		

SA-6 Gainful

The all-solid rocket/ramjet propulsion system of this mobile tactical weapon was a decade in advance of comparable western technology at the time of its debut in 1967. Mounted on an SA-6B launch vehicle equipped with SA-11 tracking gear the battery is capable of engaging two targets simultaneously.

SA-6 Gainful



Specifications

Guidance	Radio command, semiactive radar terminal homing	Range	18.5 miles
Warhead	176 lb. high explosive		

ZSU-23-4

This mobile anti-aircraft artillery vehicle is deadly to low-flying aircraft; all efforts must be made to avoid coming within its range. It is controlled with electro-optical sights, so in some cases no radar warning will be seen. Almost every infantry, artillery, and armored unit in Iraq will have several ZSU-23-4s along with them. It appears as an "A" inside a diamond on the EB-52 radar scopes.

ZSU-23-4

CLASSIFIED

Specifications

Guns	Four 23 mm	Rate of fire	200 rounds/min/barrel (automatic fire mode of 15-second bursts with 60-second cooling and reloading pauses)
Range	1 mile		

ZSU-57-2

The ZSU-57-2 is a large towed anti-aircraft artillery piece normally found in batteries of four near headquarters buildings, assembly areas, airfields, and command bunkers. It can be controlled from many miles away by other system's radars, by its own radar, or by electro-optical sights.

ZSU-57-2

CLASSIFIED

Specifications

Guns	Two 57 mm	Rate of fire	100 rounds/min/barrel (automatic fire mode of 15-second bursts with 60-second cooling and reloading pauses)
Range	1 mile		

NOTES FROM DALE "BEAR" BROWN

Welcome to the EB-52 Megafortress, the most powerful, most sophisticated multi-role combat aircraft ever devised. The Megafortress combines the long range and heavy, varied payload of a strategic bomber, the precision kill capability of a high-tech tactical fighter-bomber, and the air defense capability of a fighter.

The Megafortress was not originally designed to be an operational combat aircraft. Engineers and scientists conducting classified experiments added a variety of weapons, sensors, electronic equipment, and high-tech structural enhancements to a line B-52H-model "test bed" bomber in order to develop tactics and demonstrate compatibility for other newer weapon systems including the B-1 Lancer and B-2 Black Knight strategic bombers. The success of the "Frankenstein's monster" created by those scientists and engineers developed into the EB-52 aircraft program.

Most tactical support aircraft—counter-air fighters like the F-16 Fighting Falcon, defense suppression fighters such as the F-4G Wild Weasel, and electronic warfare aircraft such as the EF- 111 Raven or EA-6 Prowler—haven't the long range or heavy payload necessary to support strategic strike operations—they could rarely keep up with the big intercontinental-range, high-altitude B-52, or "Buff", as it is somewhat affectionately called. In addition, they often require forward basing, extensive aerial refueling support, or large-scale aircraft carrier operations close to enemy lines. Because of this, strategic strike aircraft used in conventional or nuclear combat roles often lacked sufficient defensive firepower to safely transit the critical coastal or outer-area enemy defenses. They usually went into the highest threat areas alone.

The primary mission of the Megafortress is to carry a large payload of offensive and defensive weapons over long distances ahead of other strike aircraft and create "strike corridors" for other tactical aircraft to better survive target area defenses and strike their targets. On a single sortie, the Megafortress can destroy a variety of threats, including fighters, surface-to-air missiles, anti-aircraft artillery, and enemy radar sites, causing the enemy to expend a vast amount of weapons and manpower in order to stop it. With large numbers of enemy defenses engaged, other strike aircraft can easily slip in and attack their own assigned targets.

Of course, the Megafortress makes a devastating strike aircraft itself. Carrying over fifty thousand pounds of mixed ordnance, one Megafortress can deliver as much raw firepower as four Navy A-6 Intruder strike aircraft, an EA-6 Prowler electronic warfare aircraft. a S-3 Viking anti-submarine warfare aircraft. and three F-14A Tomcat fighters—combined. The stealth characteristics of the Megafortress make it ideal for attacking heavily-defended targets, ships, and command/control facilities.

Dale Brown

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Many sources were used in creating documentation for the Megafortress, but the primary inspiration was an original double-binder *B-52G Flight Manual*, complete with change orders into the 1980s, produced at Tinker Airforce Base, Oklahoma and printed by the U.S. Government Printing Office. Although not a particularly "friendly" manual in today's fuzzy terms, it is incredibly thorough and uses an abundance of clear illustrations and notes. Some measure of credit for the continued effectiveness of the 30+ year-old Stratofortress undoubtedly is due to the quality of materials used in educating its crews. One wonders how a MiG-29 flight manual might compare.

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MEGAFORTRESS

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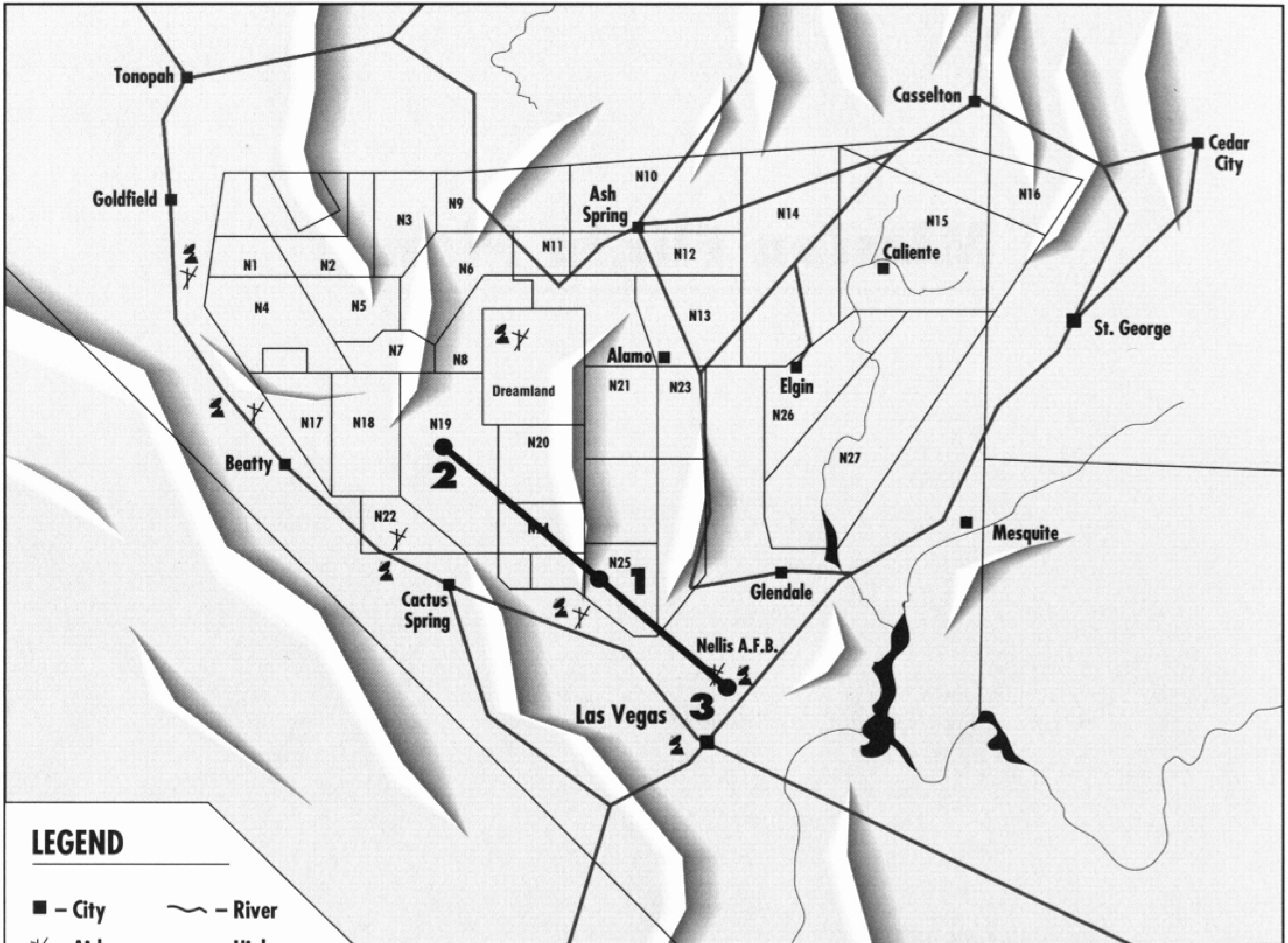
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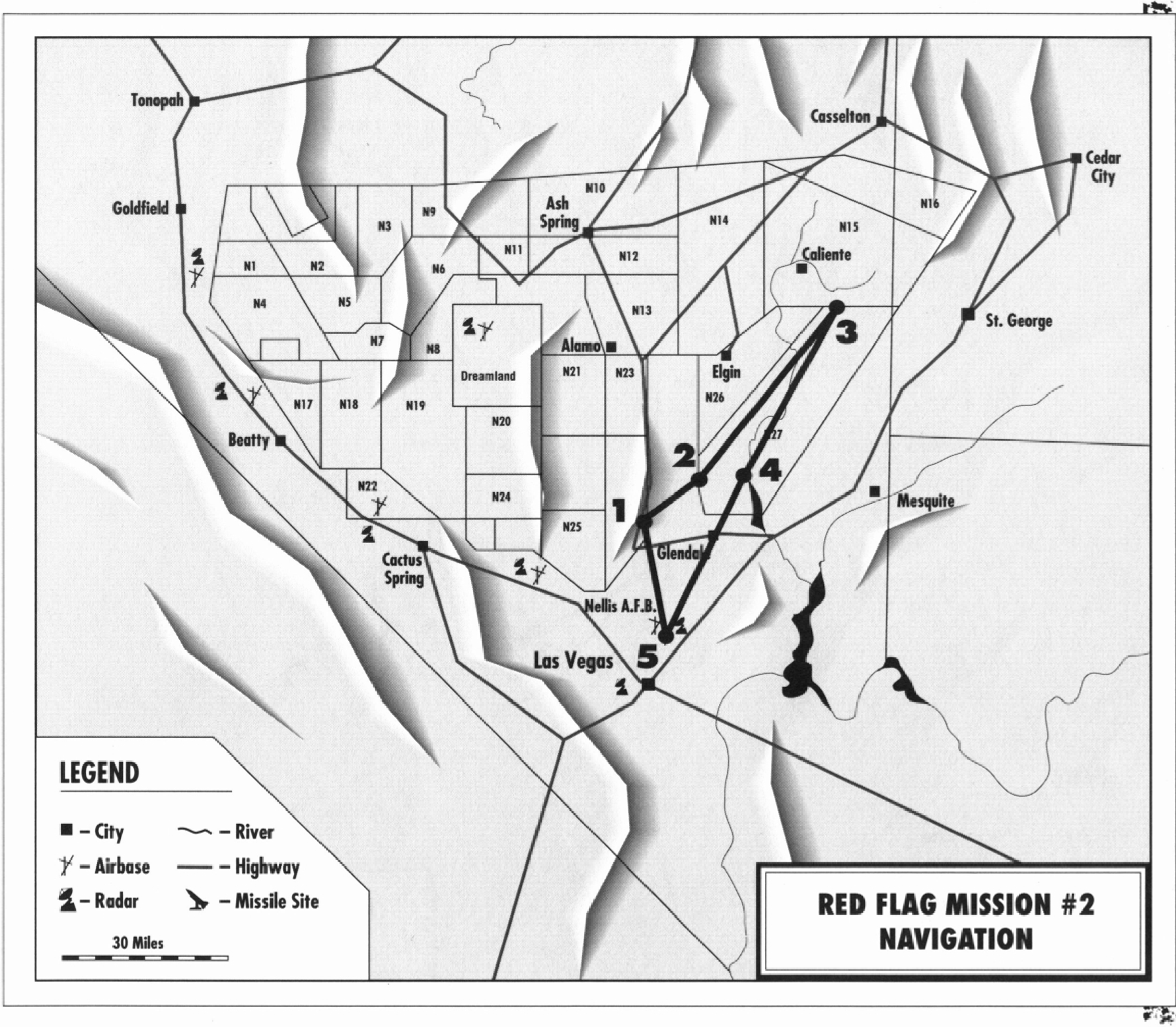
RED FLAG MISSION #1 FLIGHT PROCEDURES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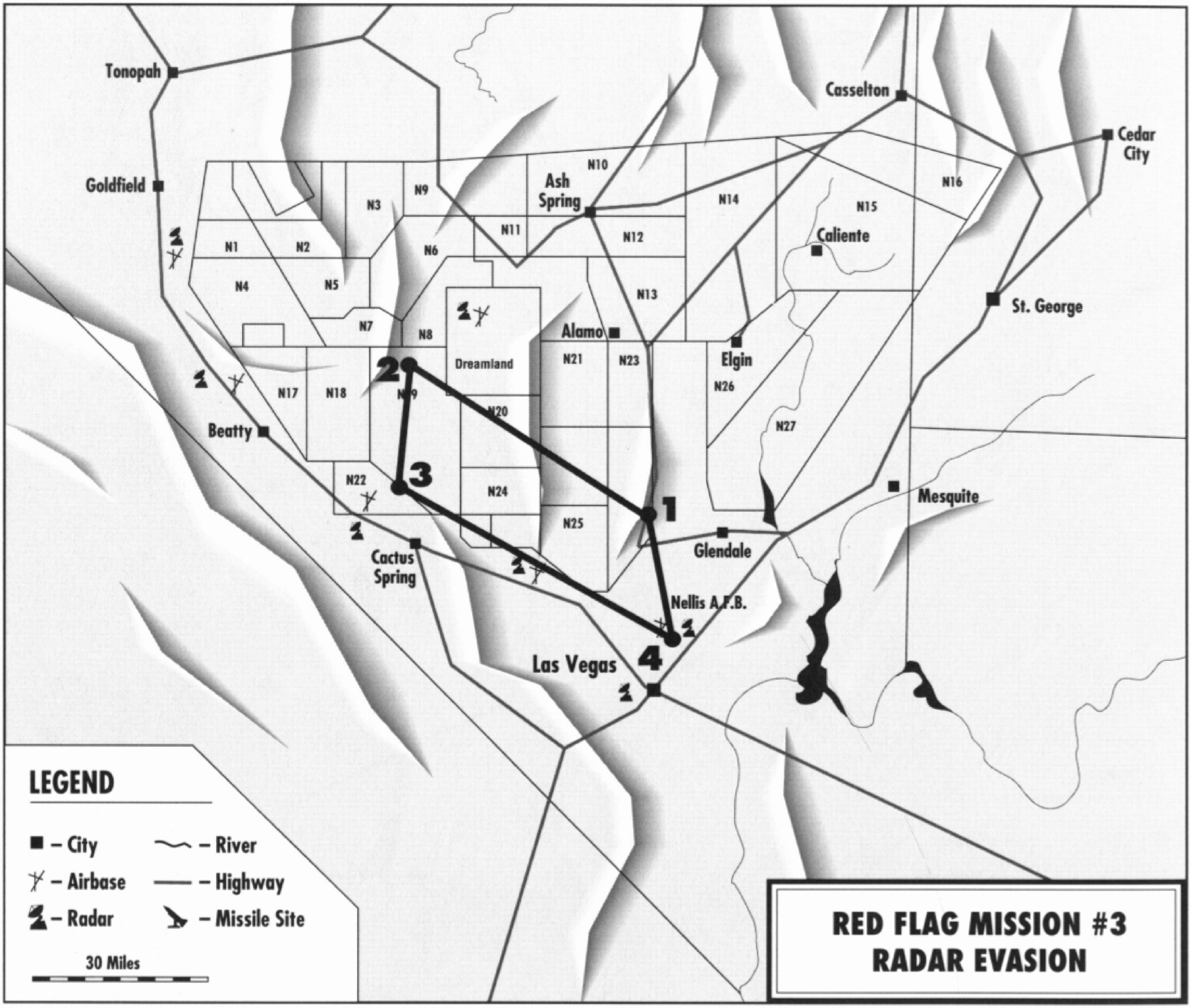
RED FLAG MISSION #2 NAVIGATION



RED FLAG MISSION #3
RADAR EVASION

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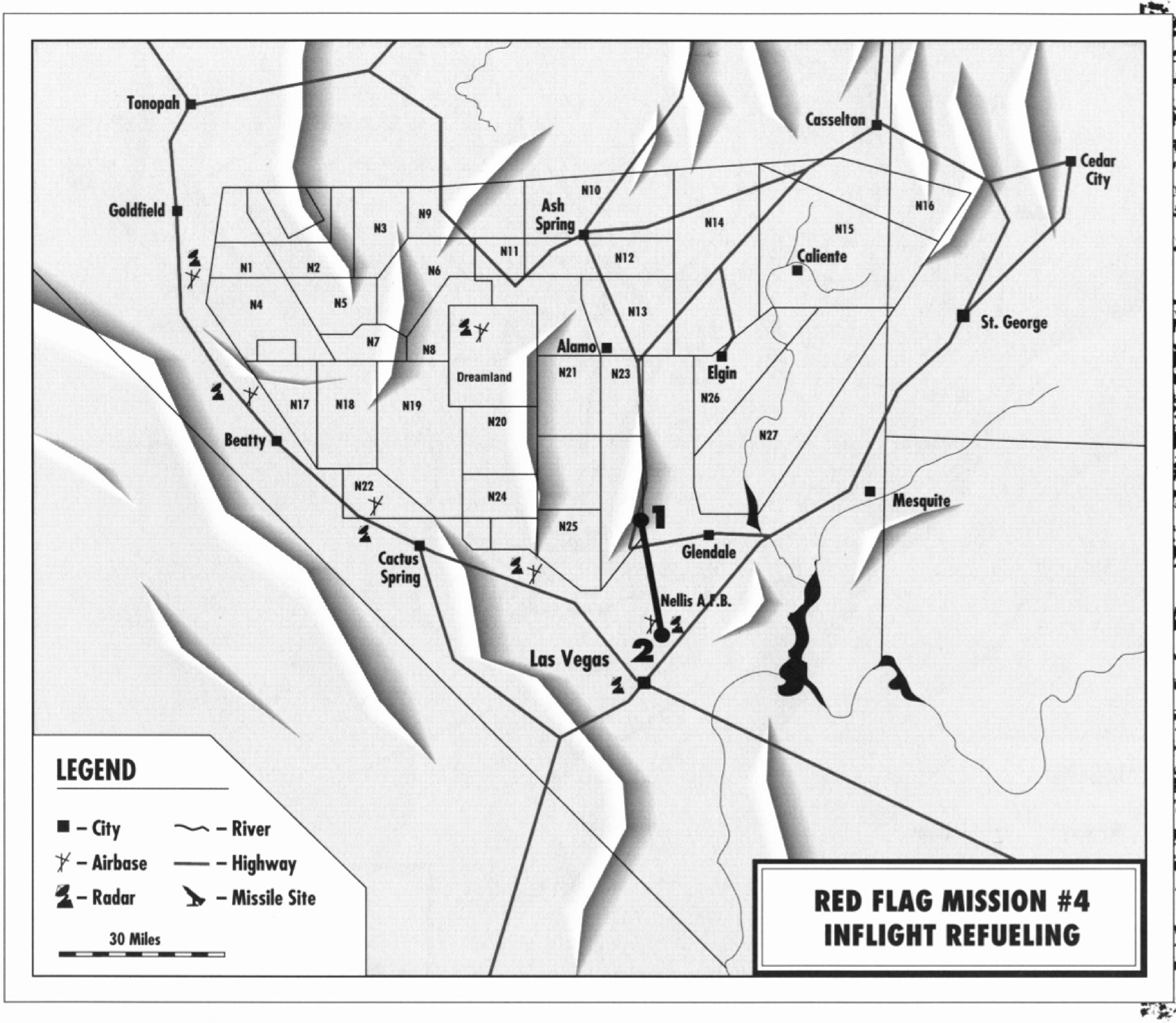
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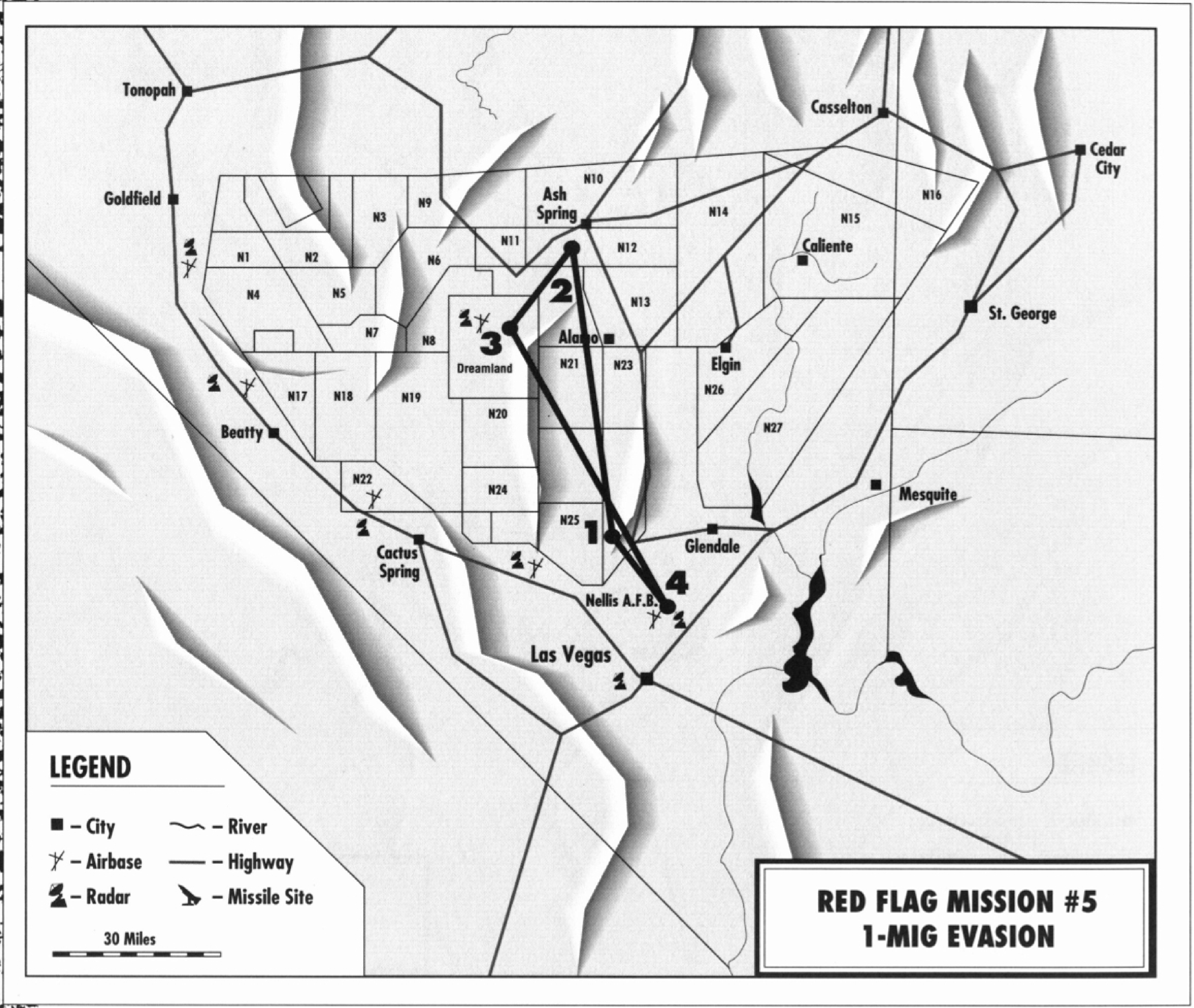
RED FLAG MISSION #4
INFLIGHT REFUELING



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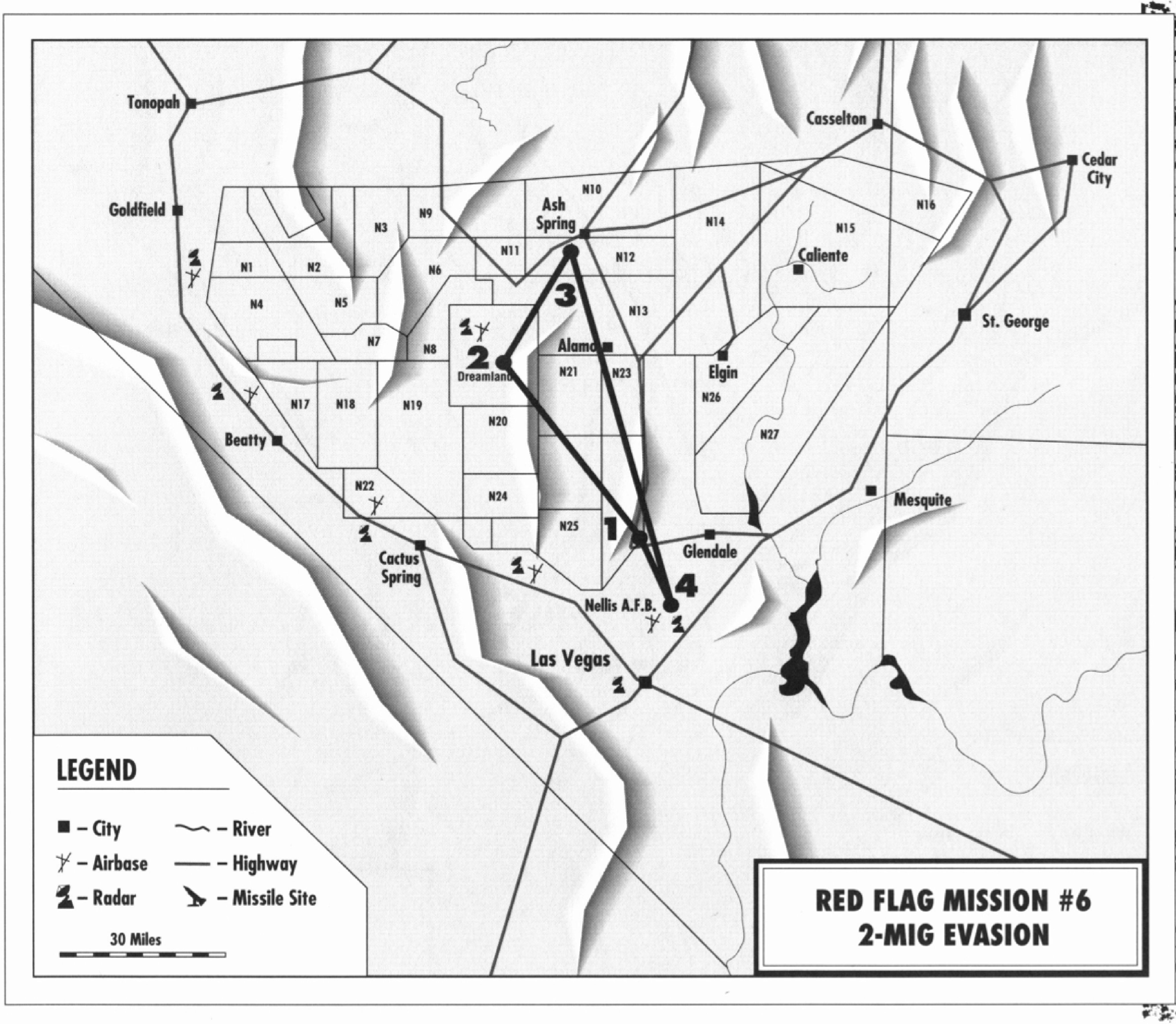
RED FLAG MISSION #5
1-MIG EVASION



RED FLAG MISSION #6
2-MIG EVASION

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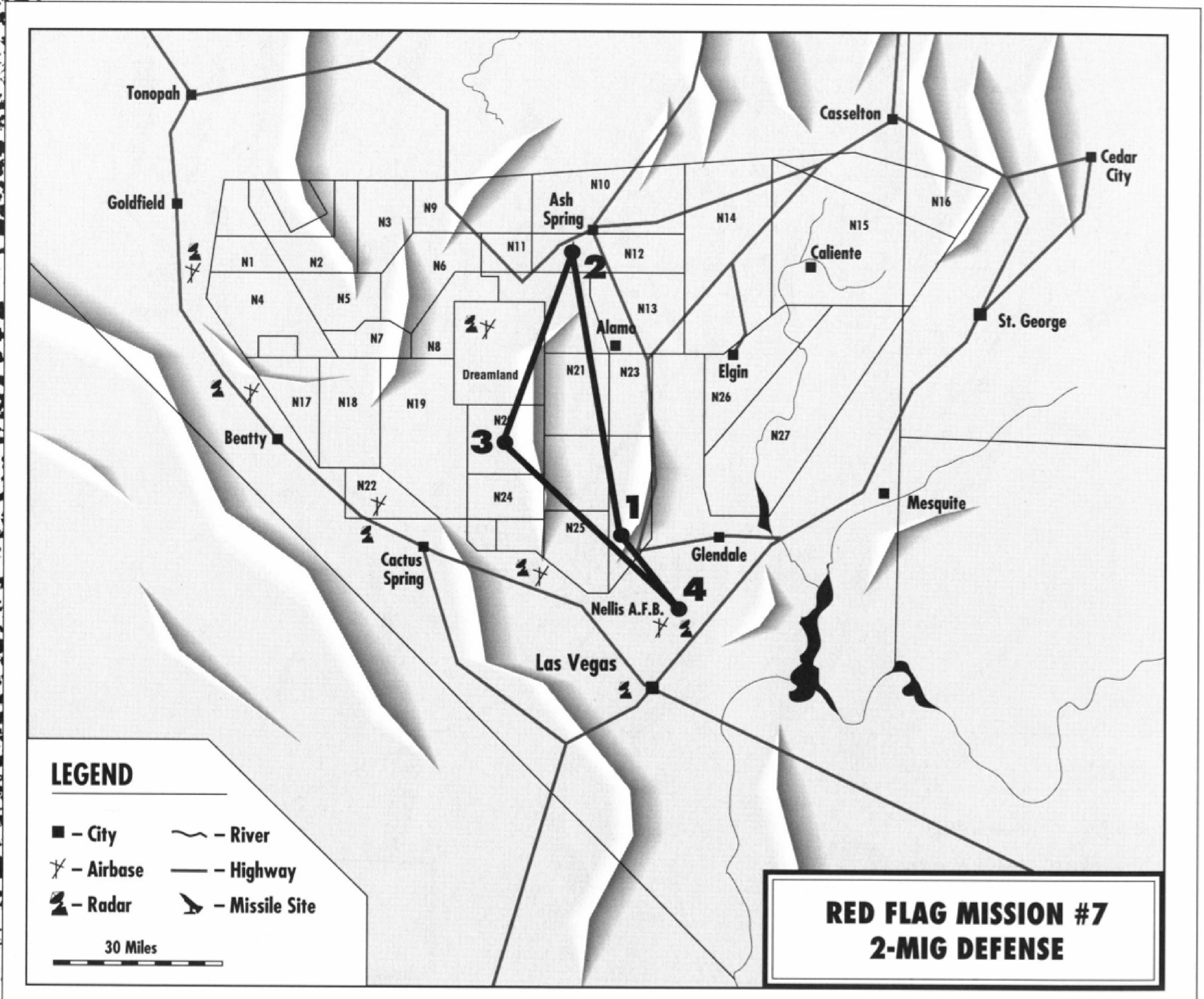
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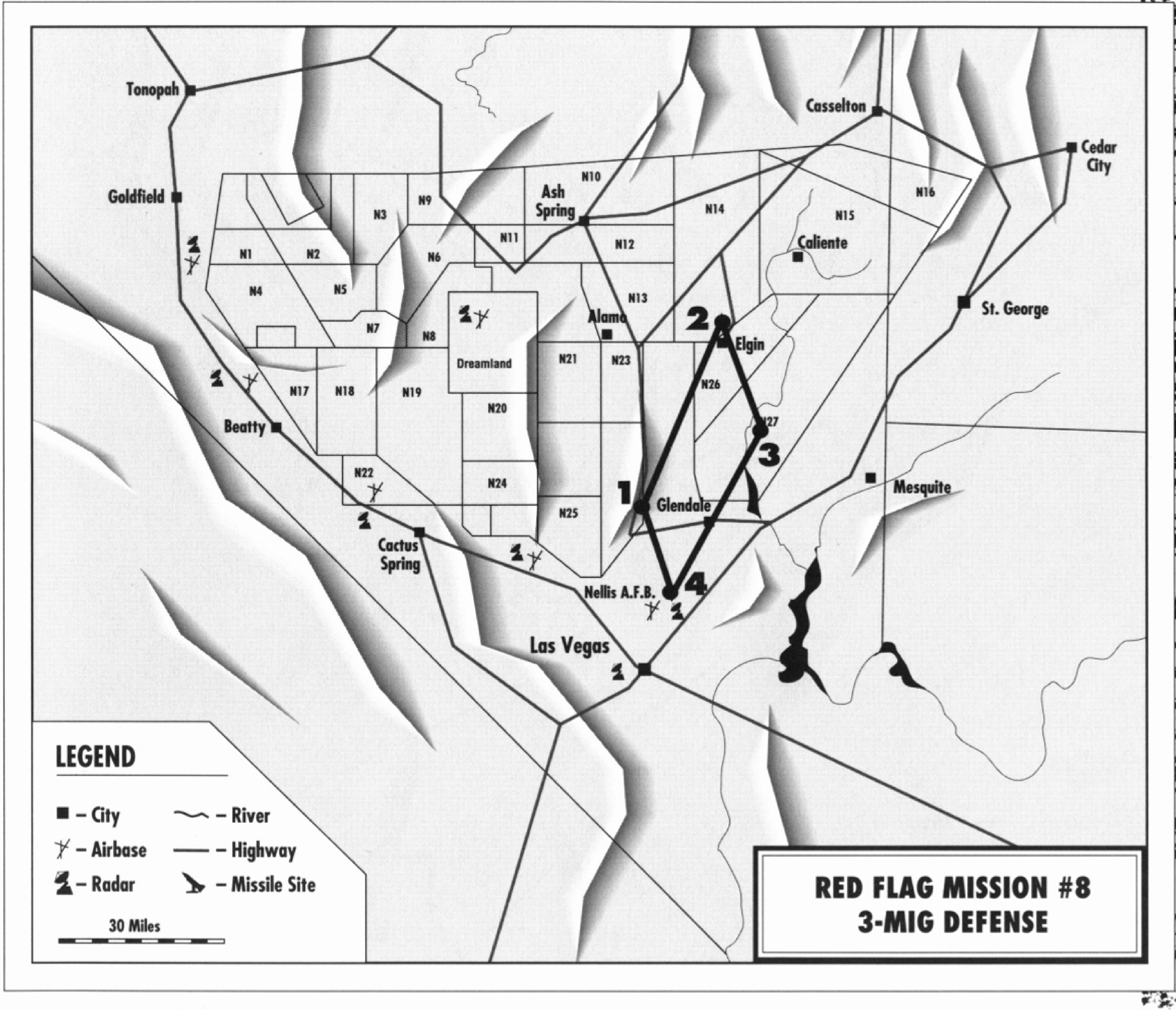
RED FLAG MISSION #7
2-MIG DEFENSE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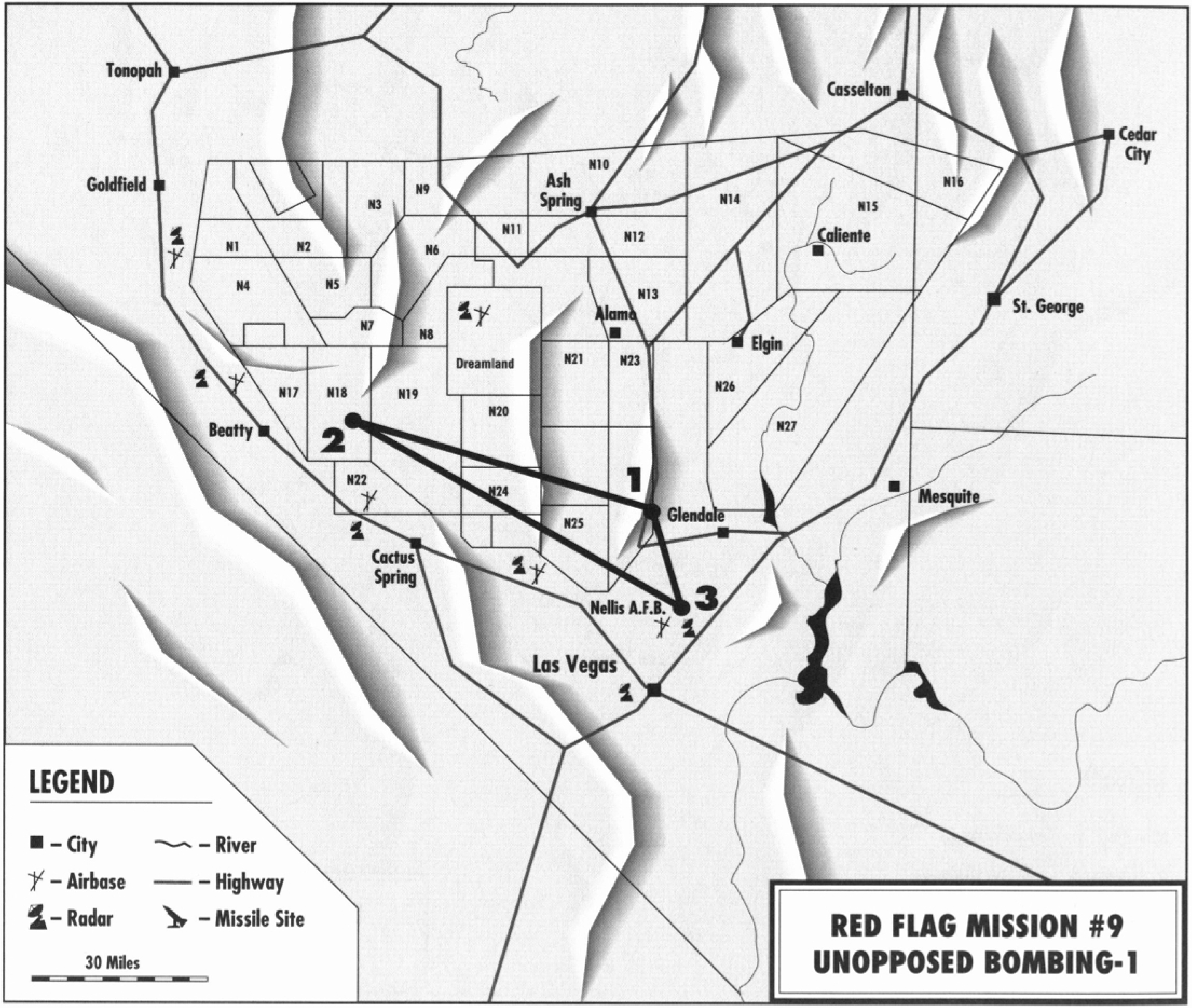
LEGEND
– City
– Airbase
– Radar
– River
– Highway
– Missile Site
30 Miles

RED FLAG MISSION #8
3-MIG DEFENSE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LEGEND
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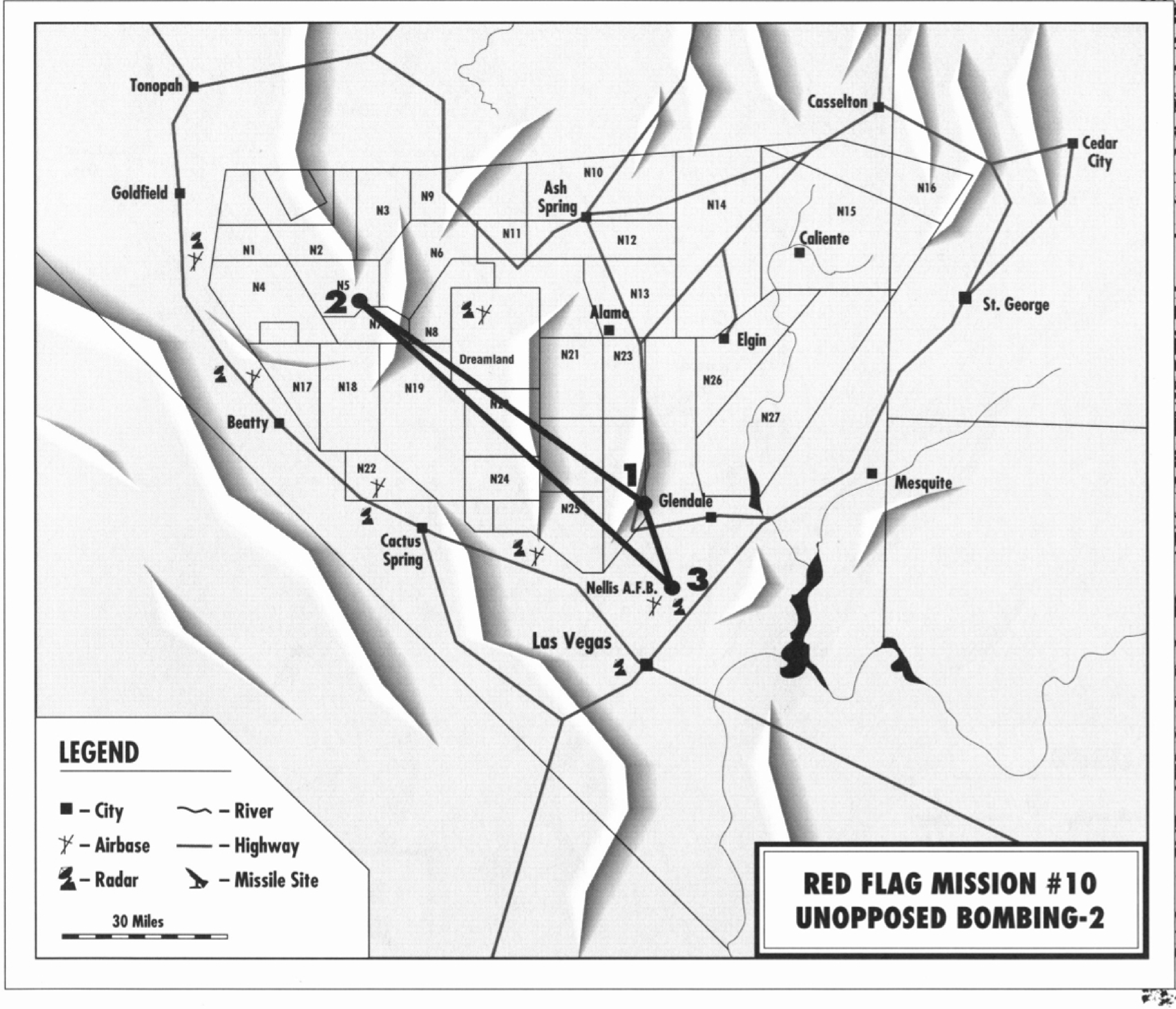
– Highway
– Missile Site
30 Miles

RED FLAG MISSION #9
UNOPPOSED BOMBING-1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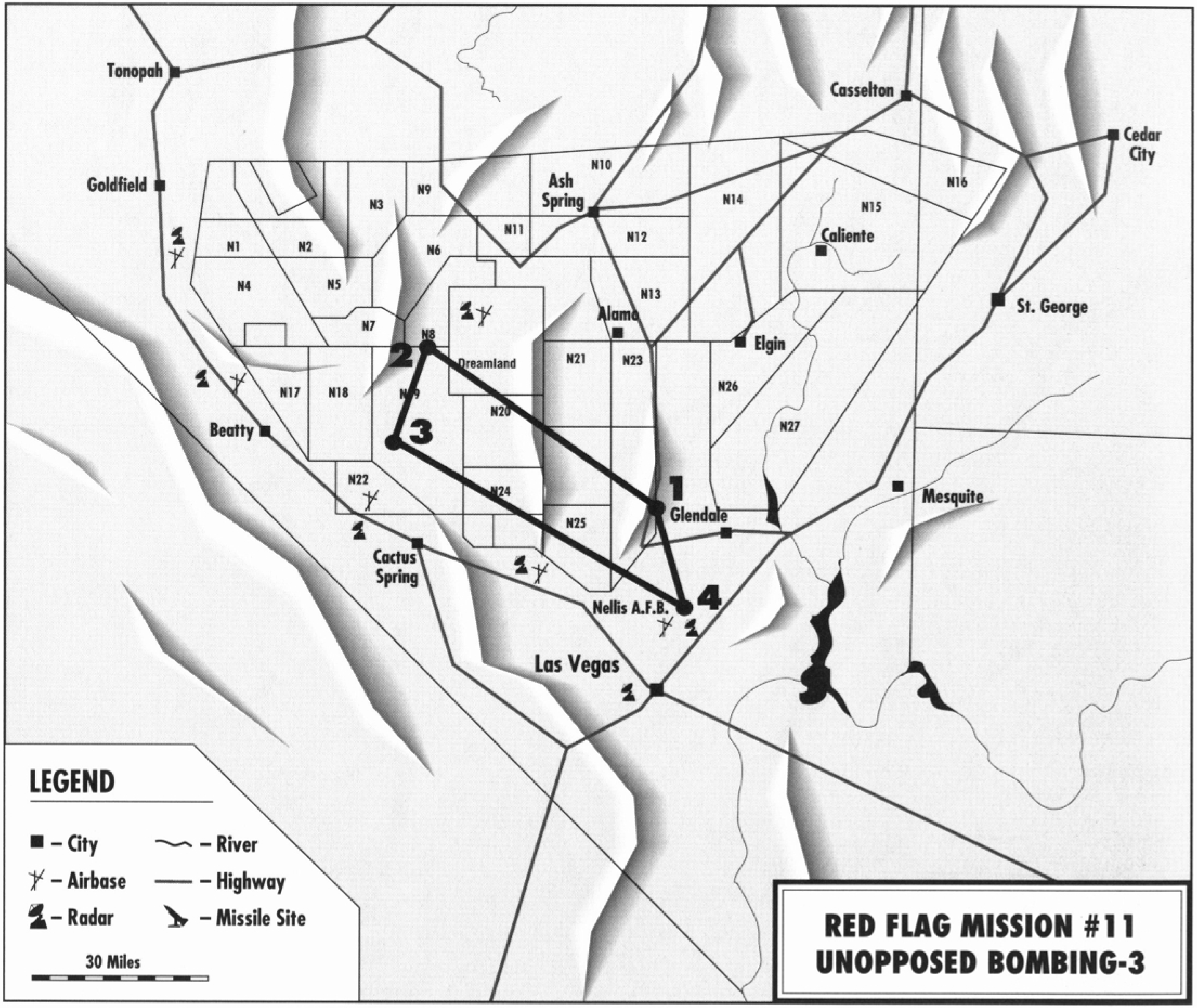
– Radar
– Missile Site
30 Miles

RED FLAG MISSION #10
UNOPPOSED BOMBING-2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LEGEND
– City
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– Radar
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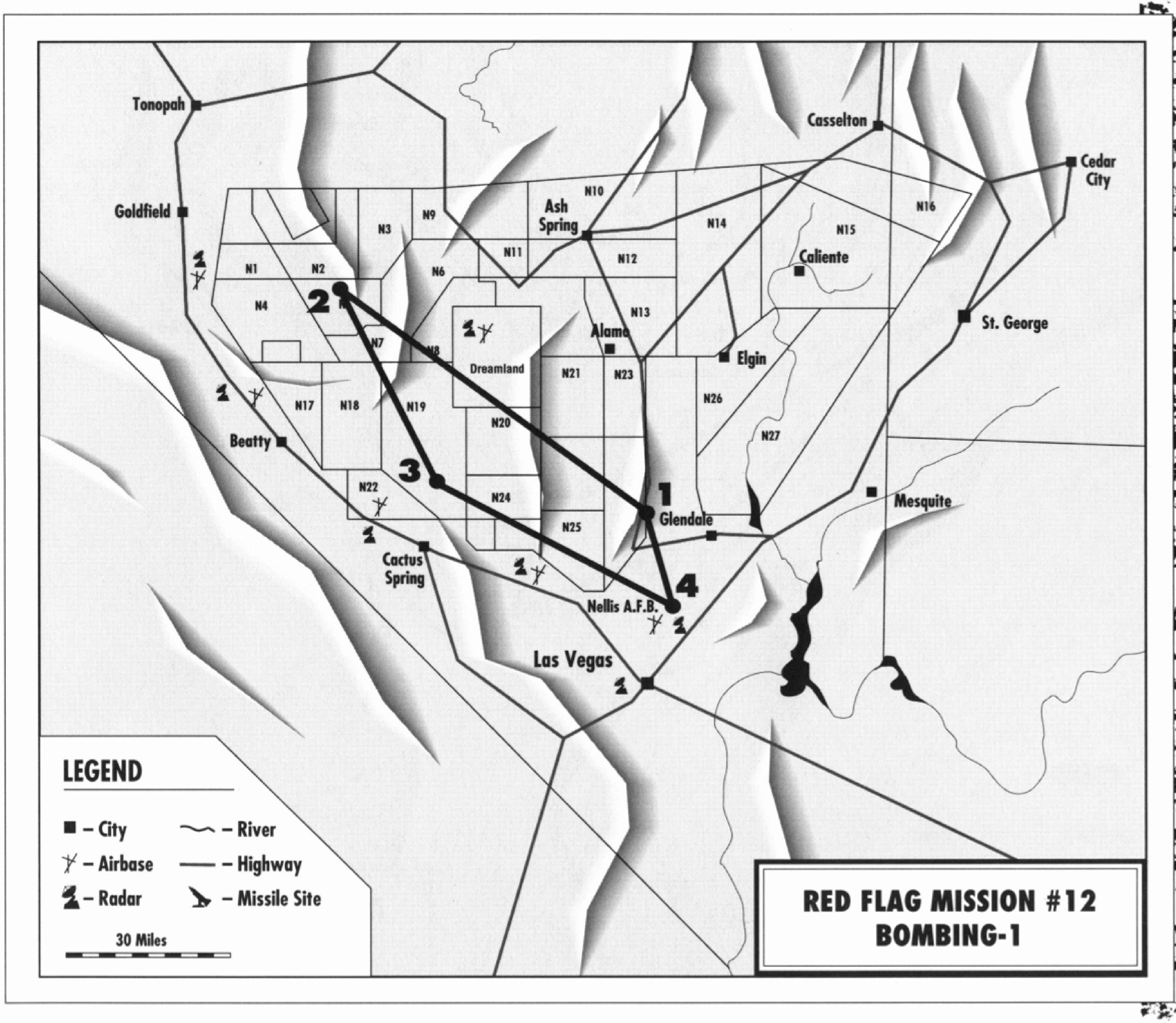
– Highway
– Missile Site
30 Miles
RED FLAG MISSION #11
UNOPPOSED BOMBING-3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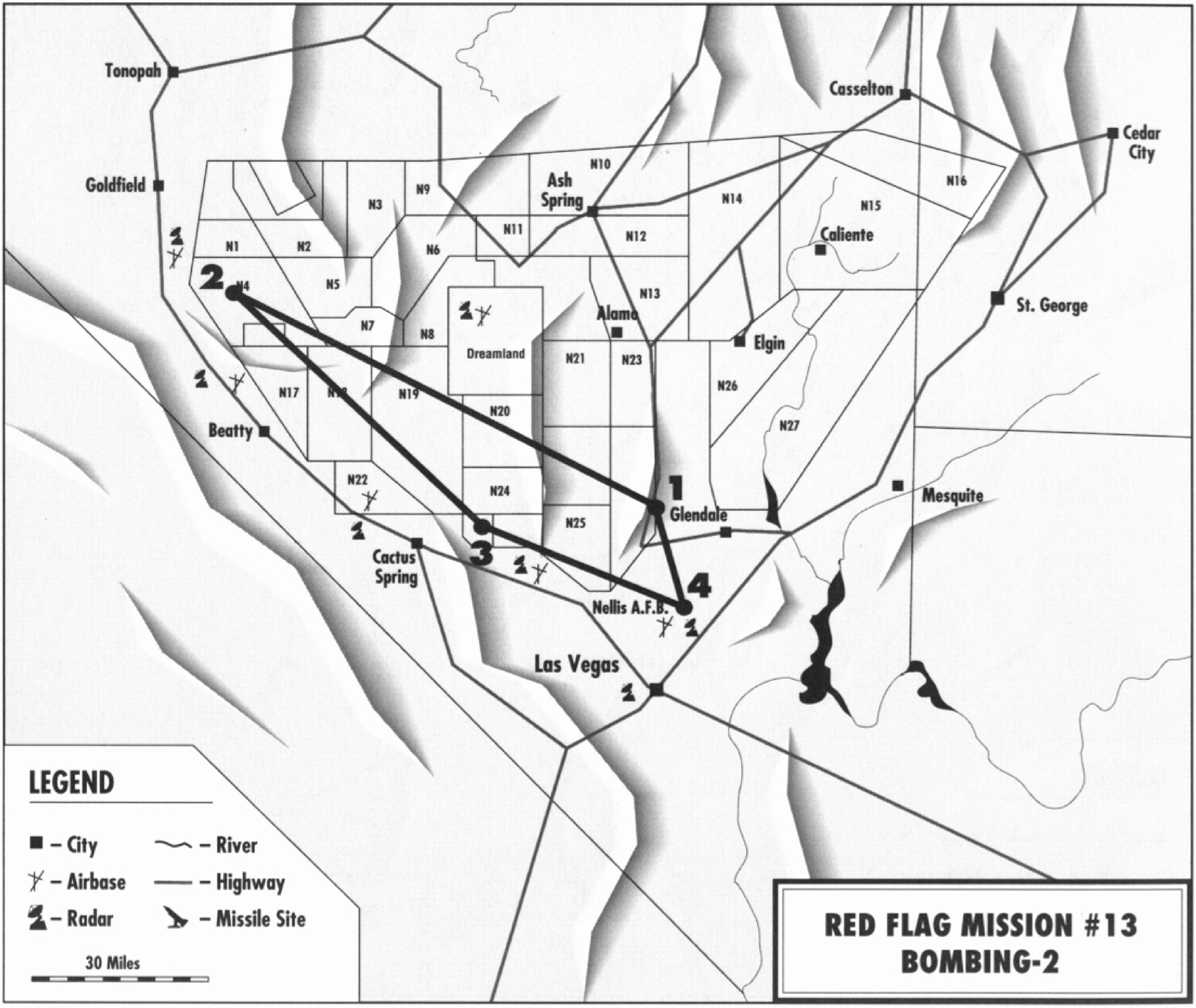
– Airbase
– Highway
– Radar
– Missile Site
30 Miles

RED FLAG MISSION #12
BOMBING-1



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Dreamland
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Cactus Spring
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LEGEND
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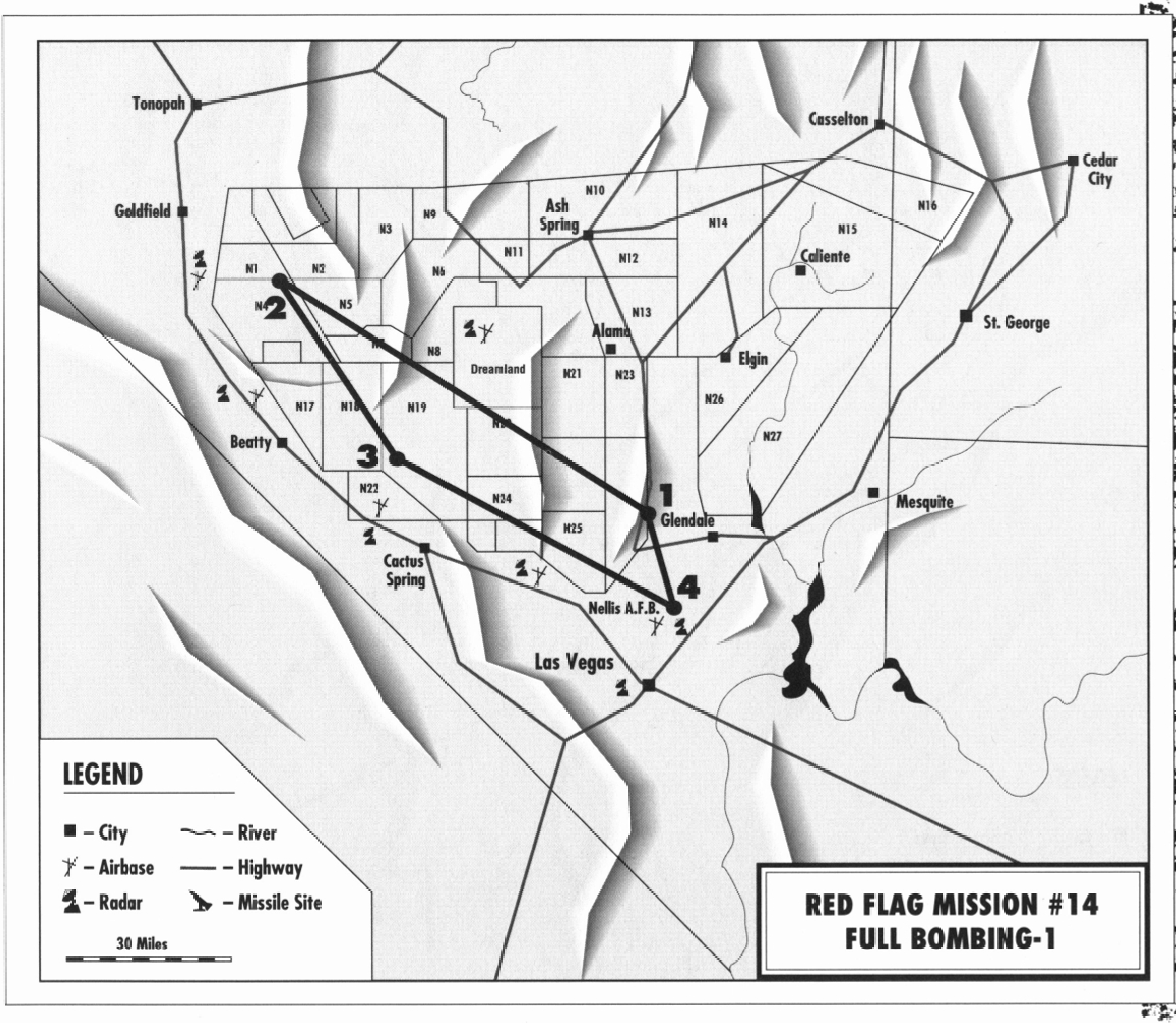
– Radar
– Missile Site
30 Miles

RED FLAG MISSION #13
BOMBING-2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LEGEND
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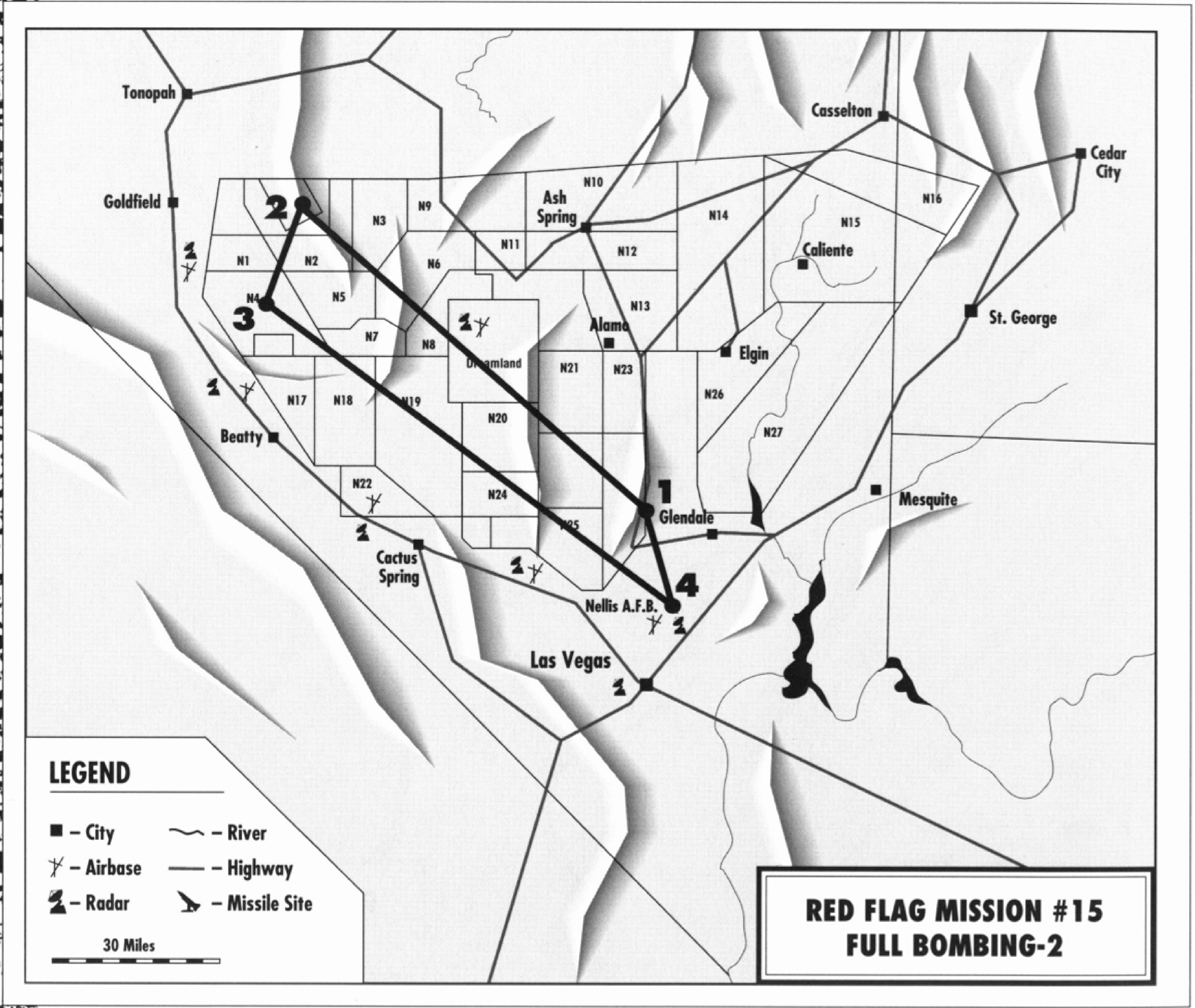
– Airbase
– Radar
– River
– Highway
– Missile Site
30 Miles

RED FLAG MISSION #14
FULL BOMBING-1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St. George
Alamo
Elgin
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Beatty
Glendale
Mesquite
Cactus Spring
Nellis A.F.B.
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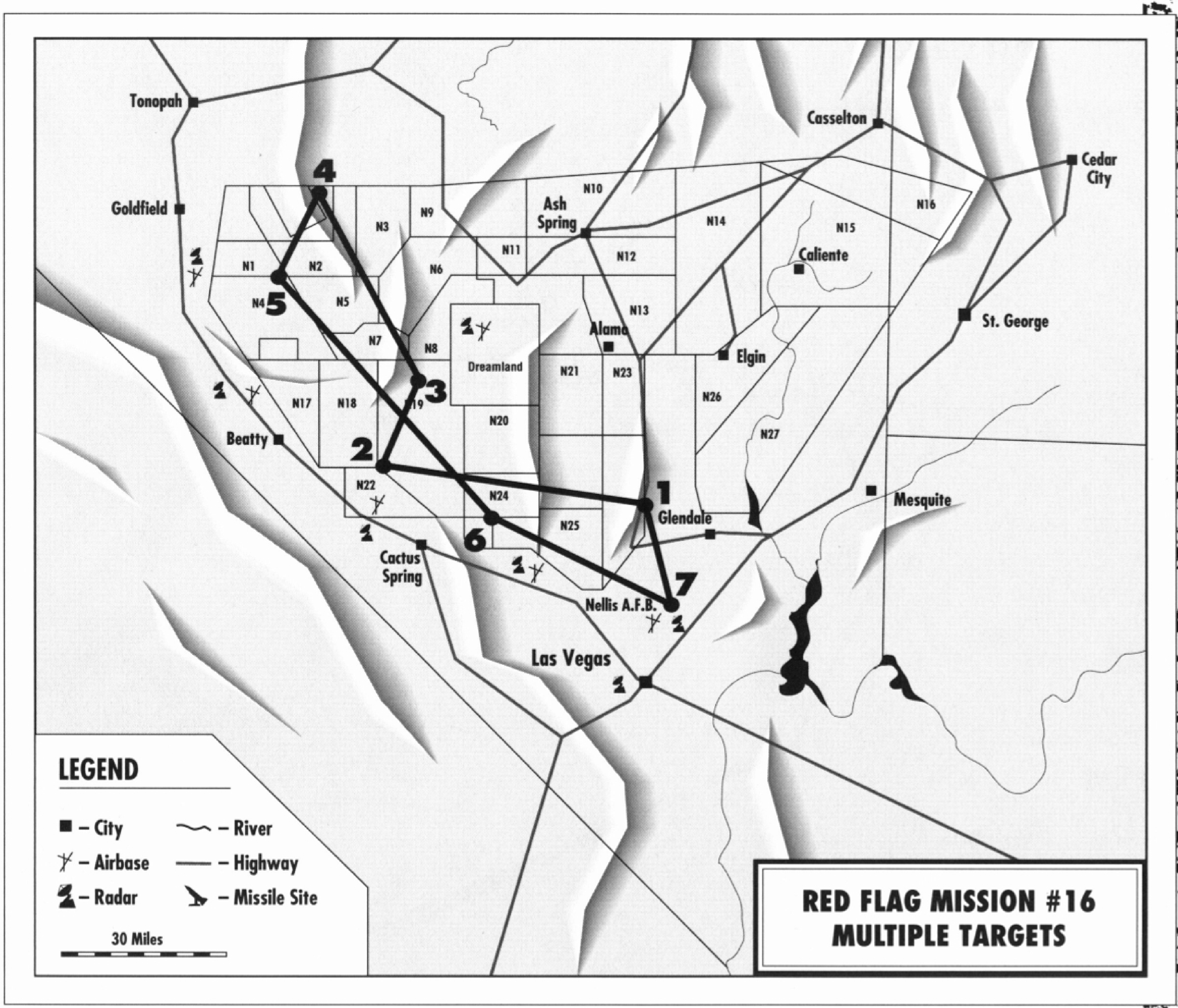
LEGEND
■ – City
– Airbase
– Radar
– River
– Highway
– Missile Site
30 Miles

RED FLAG MISSION #15
FULL BOMBING-2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Caliente
St. George
Alamo
Elgin
Dreamland
Beatty
Glendale
Mesquite
Cactus Spring
Nellis A.F.B.
Las Vegas
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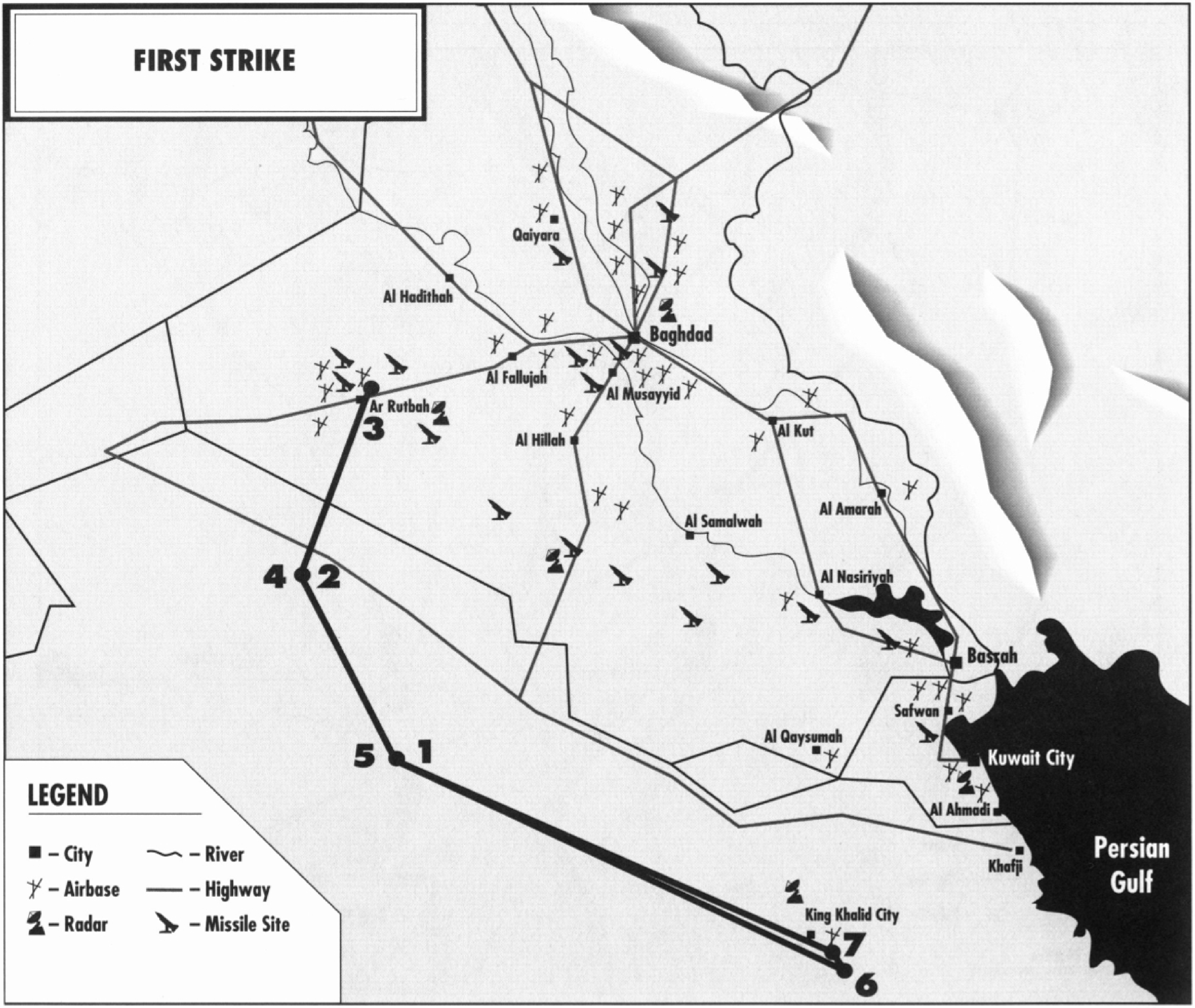
LEGEND
■ – City
– Airbase
– Radar
– River
– Highway
– Missile Site
30 Miles

RED FLAG MISSION #16
MULTIPLE TARGETS

FIRST STRIKE


Qaiyara
Al Hadithah
Baghdad
Al Fallujah
Ar Rutbah
Al Musayyid
Al Hillah
Al Kut
Al Amarah
Al Samalwah
Al Nasiriyah
Basrah
Safwan
Al Qaysumah
Kuwait City
Al Ahmadi
Khafji
Persian Gulf
King Khalid City
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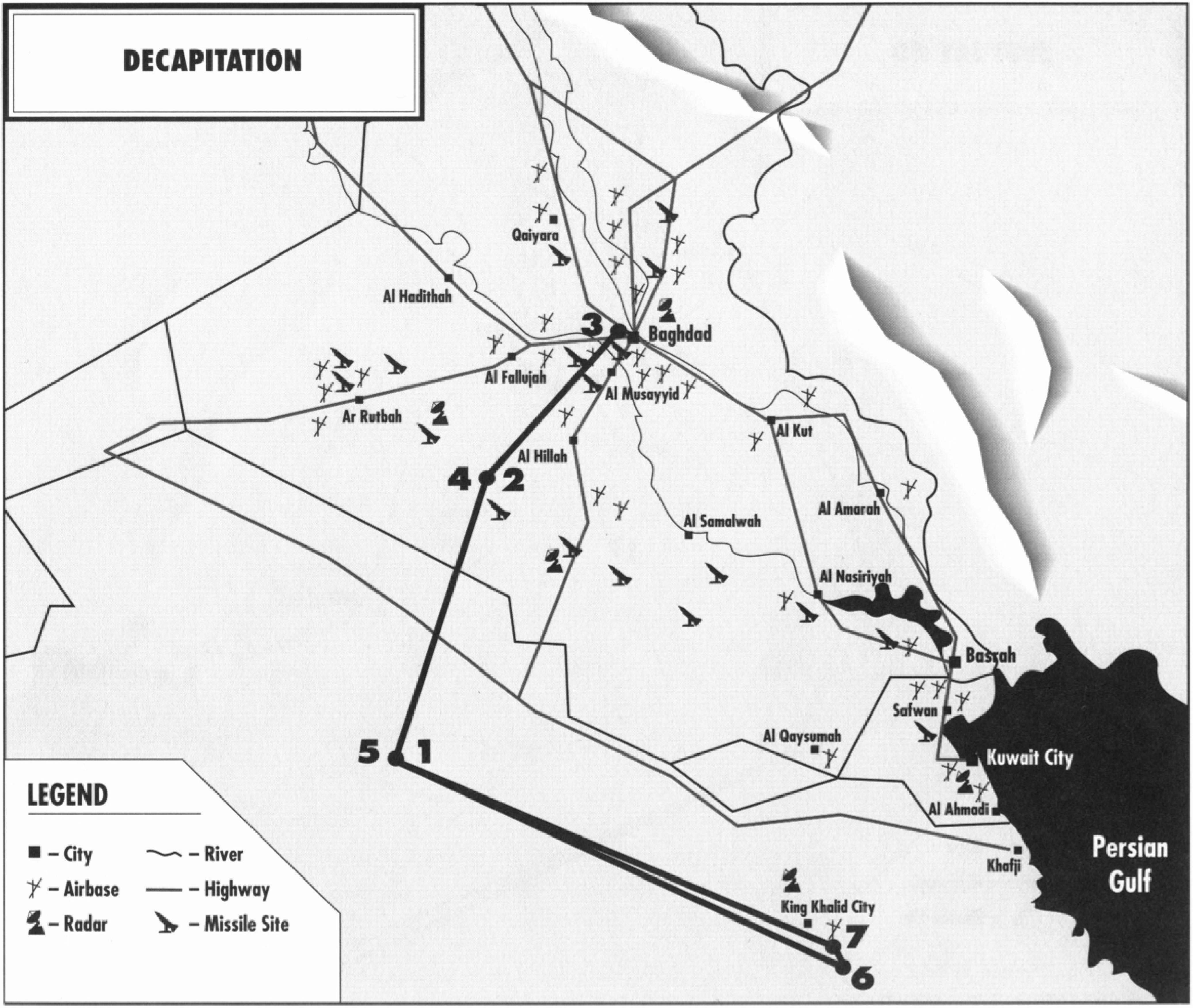
LEGEND
■ – City
– Airbase
– Radar
– River
– Highway
– Missile Site

DECAPITATION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Al Hadithah
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Baghdad
Al Fallujah
Al Musayyid
Ar Rutbah
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Al Nasiriyah
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Safwan
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Al Ahmadi
Khafji
Persian Gulf
King Khalid City
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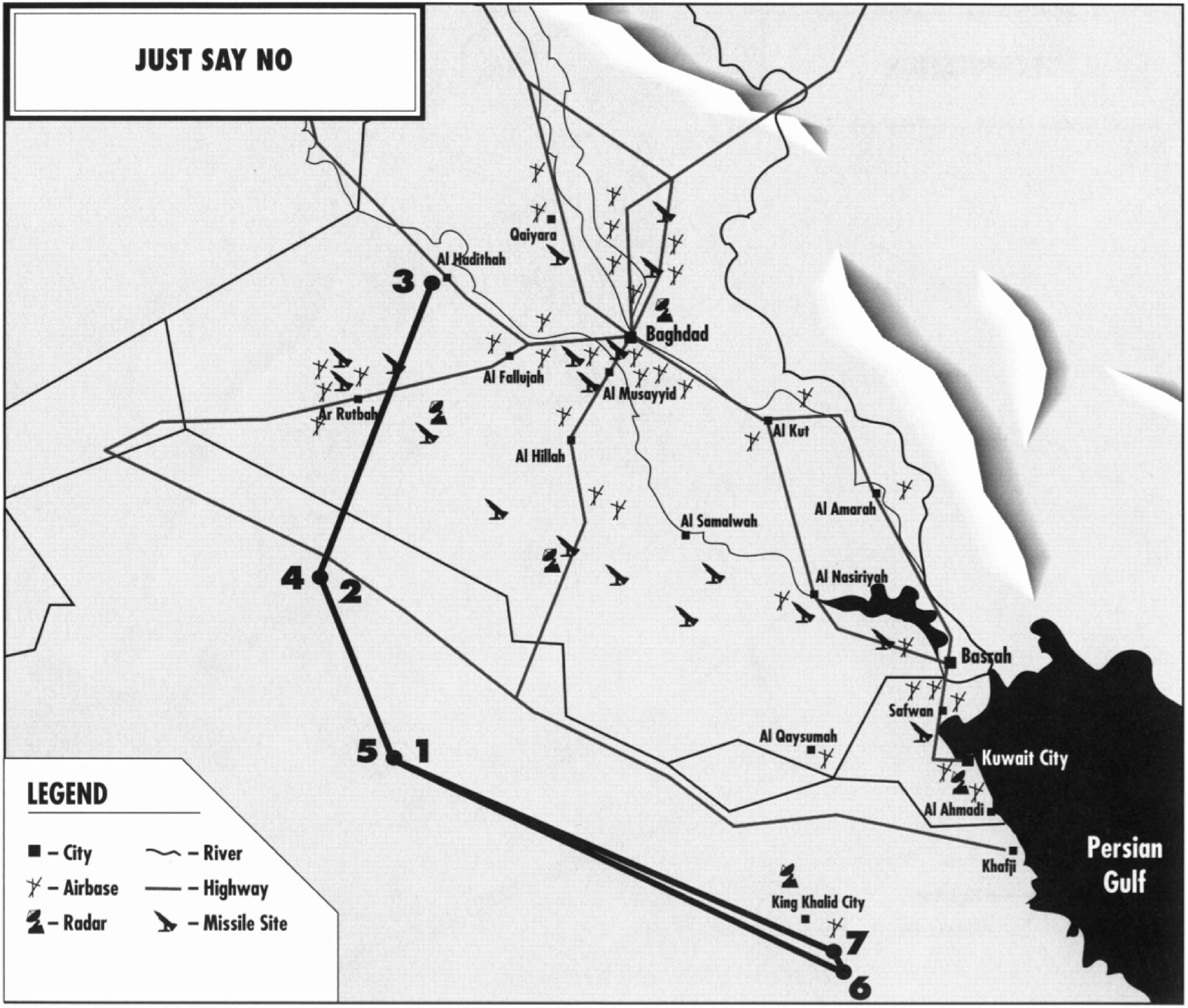
LEGEND
■ – City
– Airbase
– Radar
– River
– Highway
– Missile Site

JUST SAY NO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Baghdad
Al Fallujah
Al Musayyid
Ar Rutbah
Al Kut
Al Hillah
Al Amarah
Al Samalwah
Al Nasiriyah
Basrah
Safwan
Al Qaysumah
Kuwait City
Al Ahmadi
Khafji
King Khalid City
Persian Gulf
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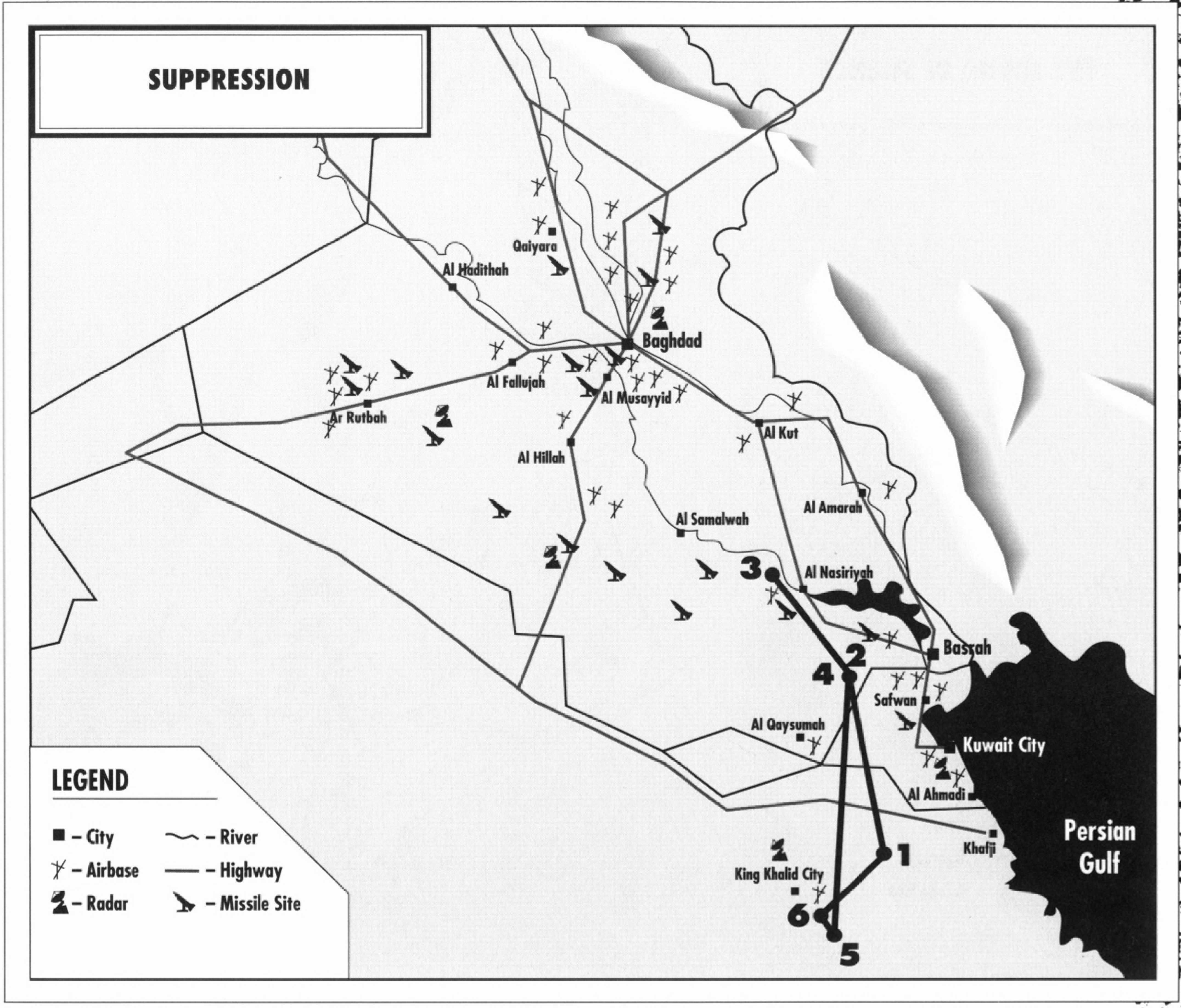
LEGEND
■ – City
– Airbase
– Radar
– River
– Highway
– Missile Site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Baghdad
Al Fallujah
Ar Rutbah
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Al Hillah
Al Amarah
Al Samalwah
Al Nasiriyah
Basrah
Safwan
Al Qaysumah
Kuwait City
Al Ahmadi
Khafji
King Khalid City
Persian Gulf
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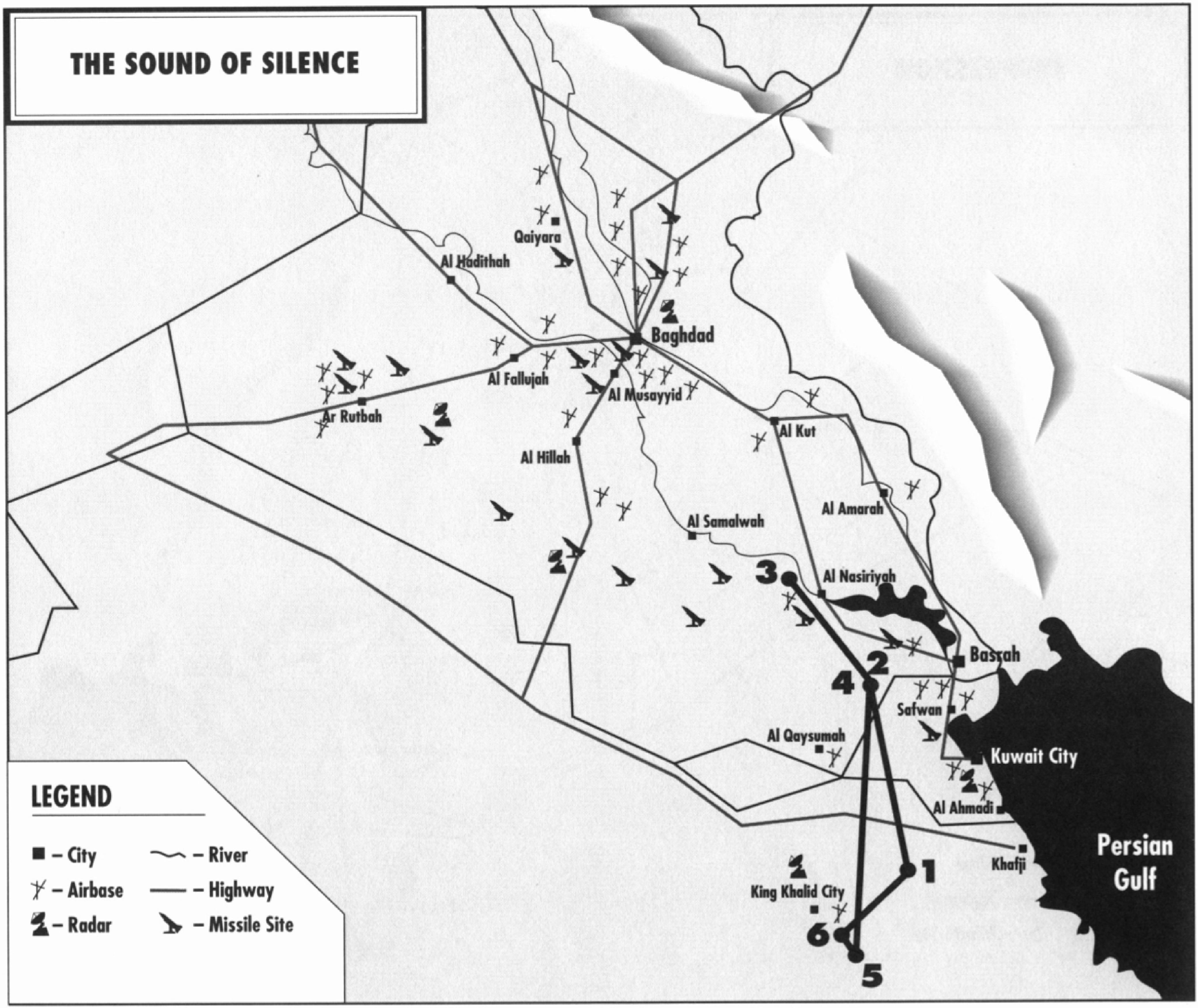
LEGEND
■ – City
– River
– Airbase
– Highway
– Radar
– Missile Site

THE SOUND OF SILENCE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Al Hadithah
Baghdad
Al Fallujah
Ar Rutbah
Al Musayyid
Al Hillah
Al Kut
Al Amarah
Al Samalwah
Al Nasiriyah
Basrah
Safwan
Al Qaysumah
Kuwait City
Al Ahmadi
Khafji
King Khalid City
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■ – City
– Airbase
– Radar
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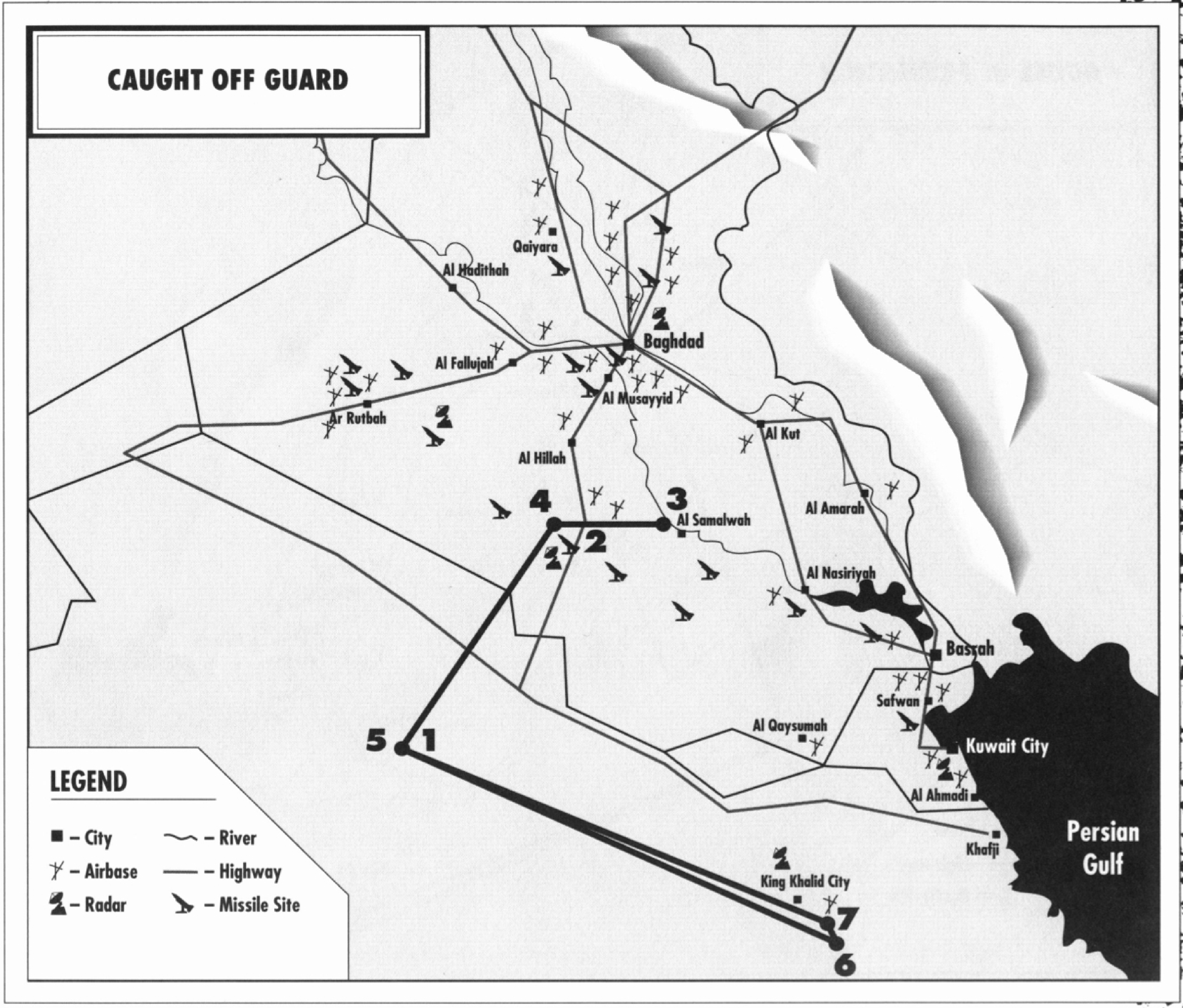
– Highway
– Missile Site



CAUGHT OFF GUARD

Qaiyara
Al Hadithah
Baghdad
Al Fallujah
Ar Rutbah
Al Musayyid
Al Hillah
Al Kut
Al Amarah
Al Samalwah
Al Nasiriyah
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Al Qaysumah
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Khafji
King Khalid City
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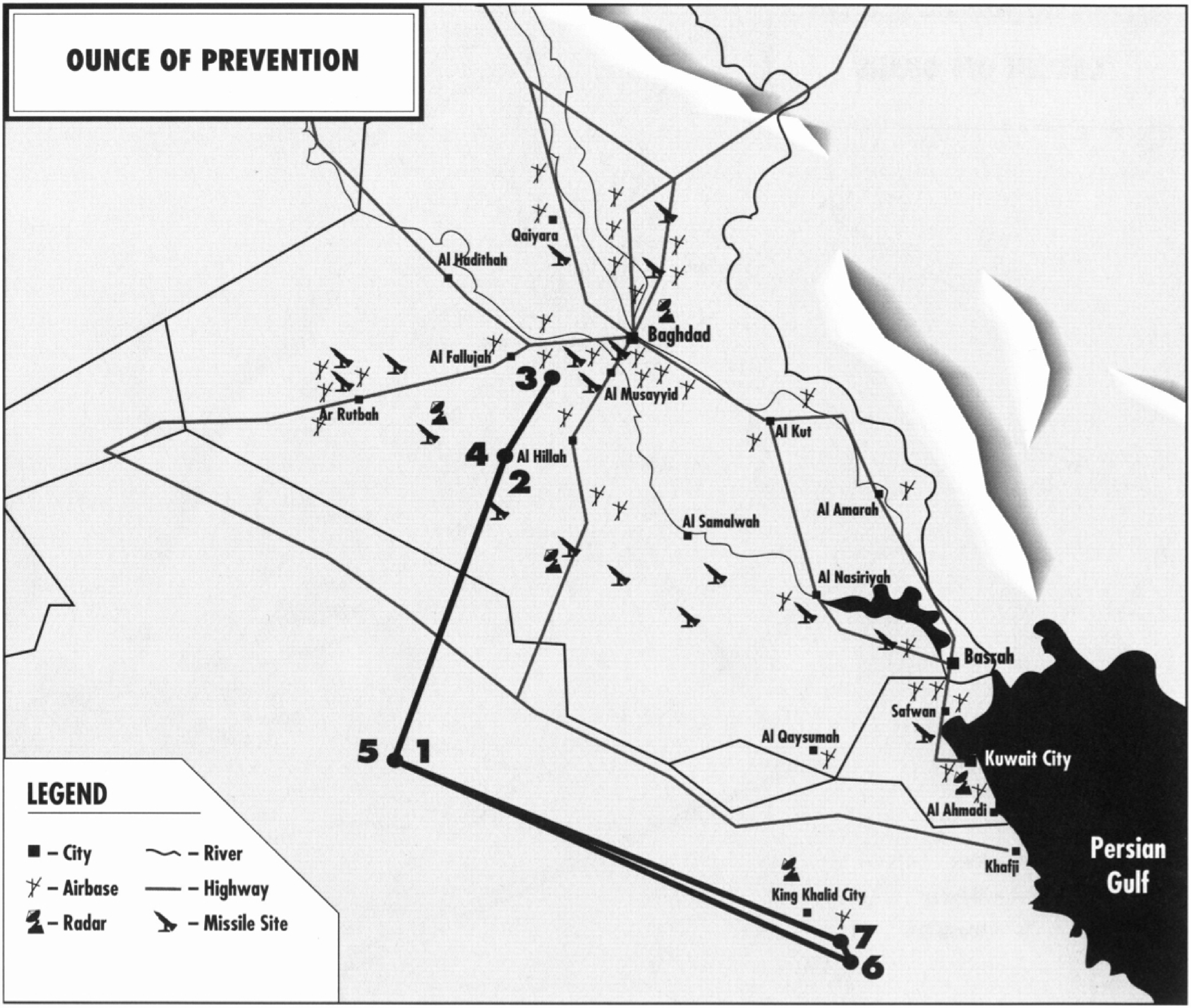
– Airbase
– Radar
– River
– Highway
– Missile Site


OUNCE OF PREVENTION
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Al Hillah
Al Kut
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Al Samalwah
Al Nasiriyah
Basrah
Safwan
Al Qaysumah
Kuwait City
Al Ahmadi
Khafji
King Khalid City
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LEGEND
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– Airbase
– Radar
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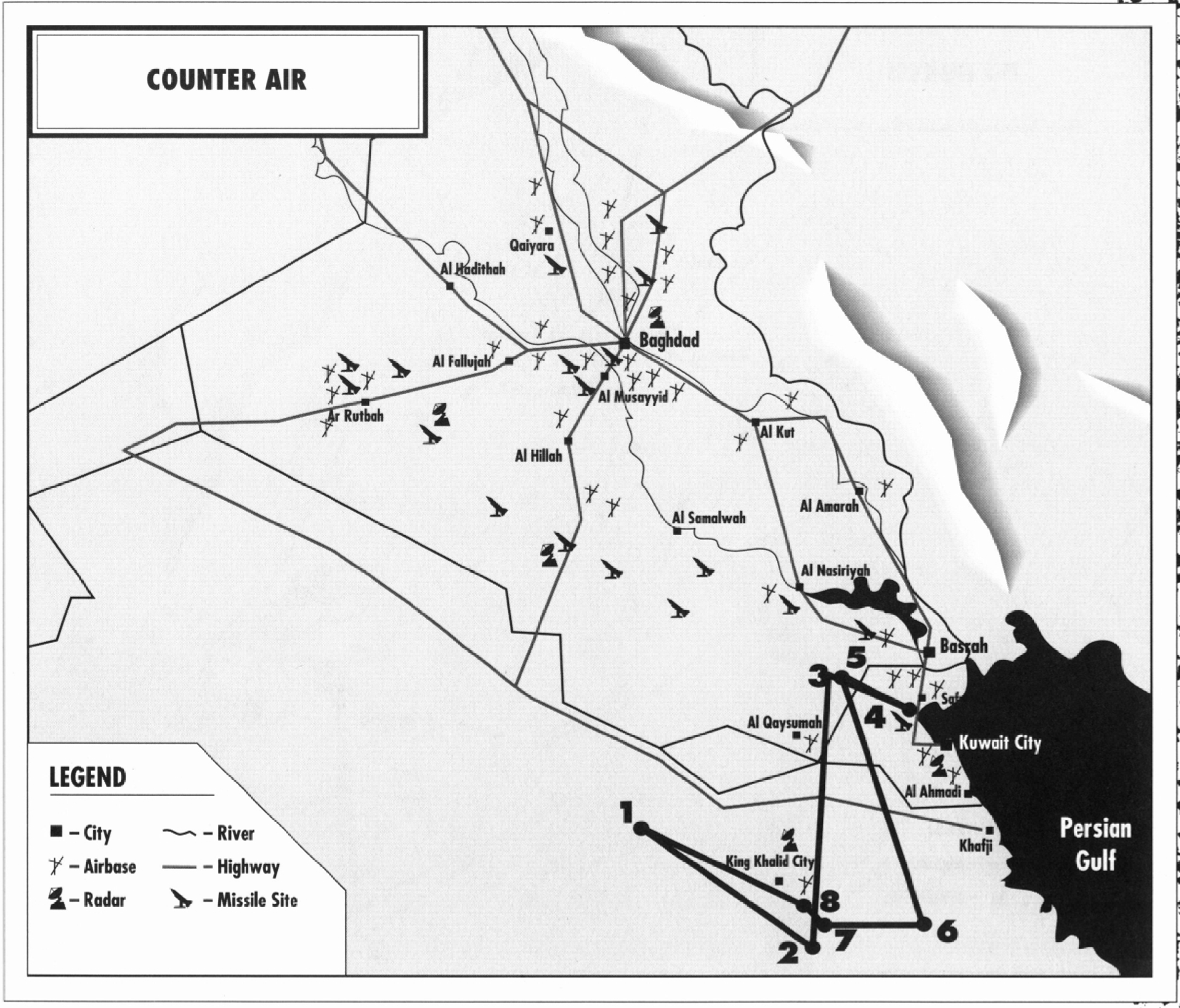

COUNTER AIR

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Al Fallujah
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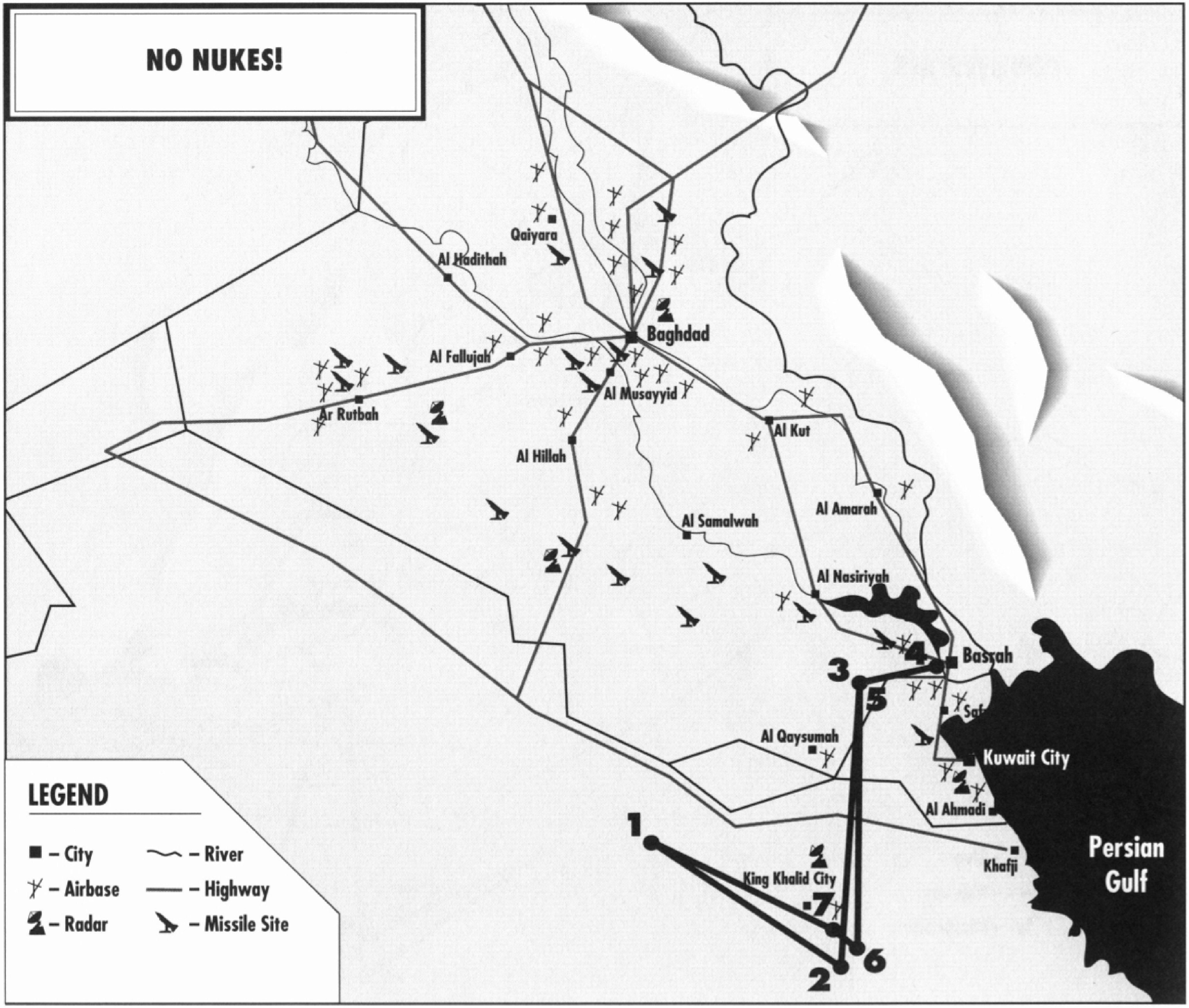
– Airbase
– Highway
– Radar
– Missile Site



NO NUKES!

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Baghdad
Al Fallujah
Al Musayyid
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Al Kut
Al Amarah
Al Samalwah
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Al Ahmadi
Khafji
King Khalid City
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– Radar
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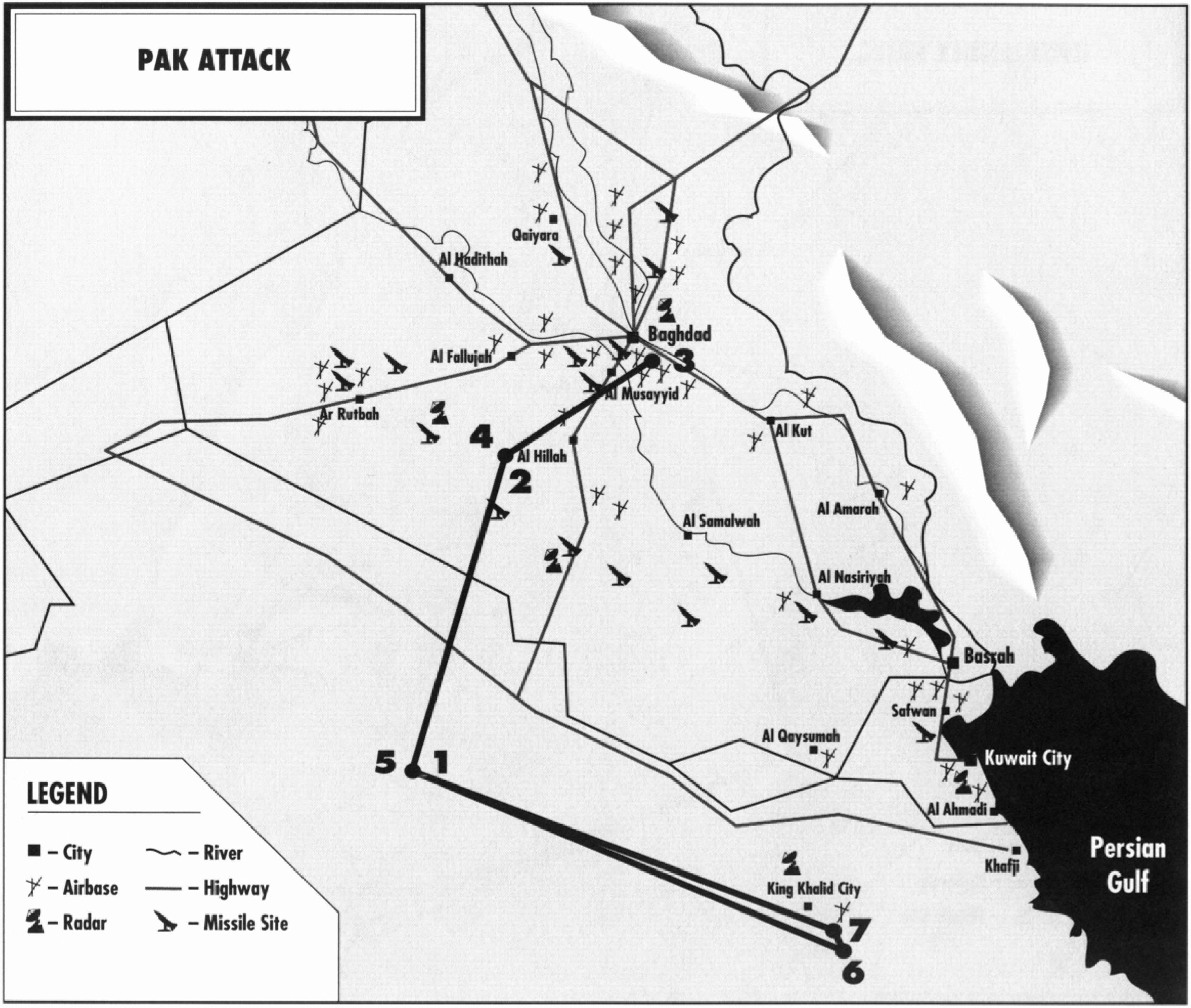
– Highway
– Missile Site



PAK ATTACK

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Al Hadithah
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Al Fallujah
Al Musayyid
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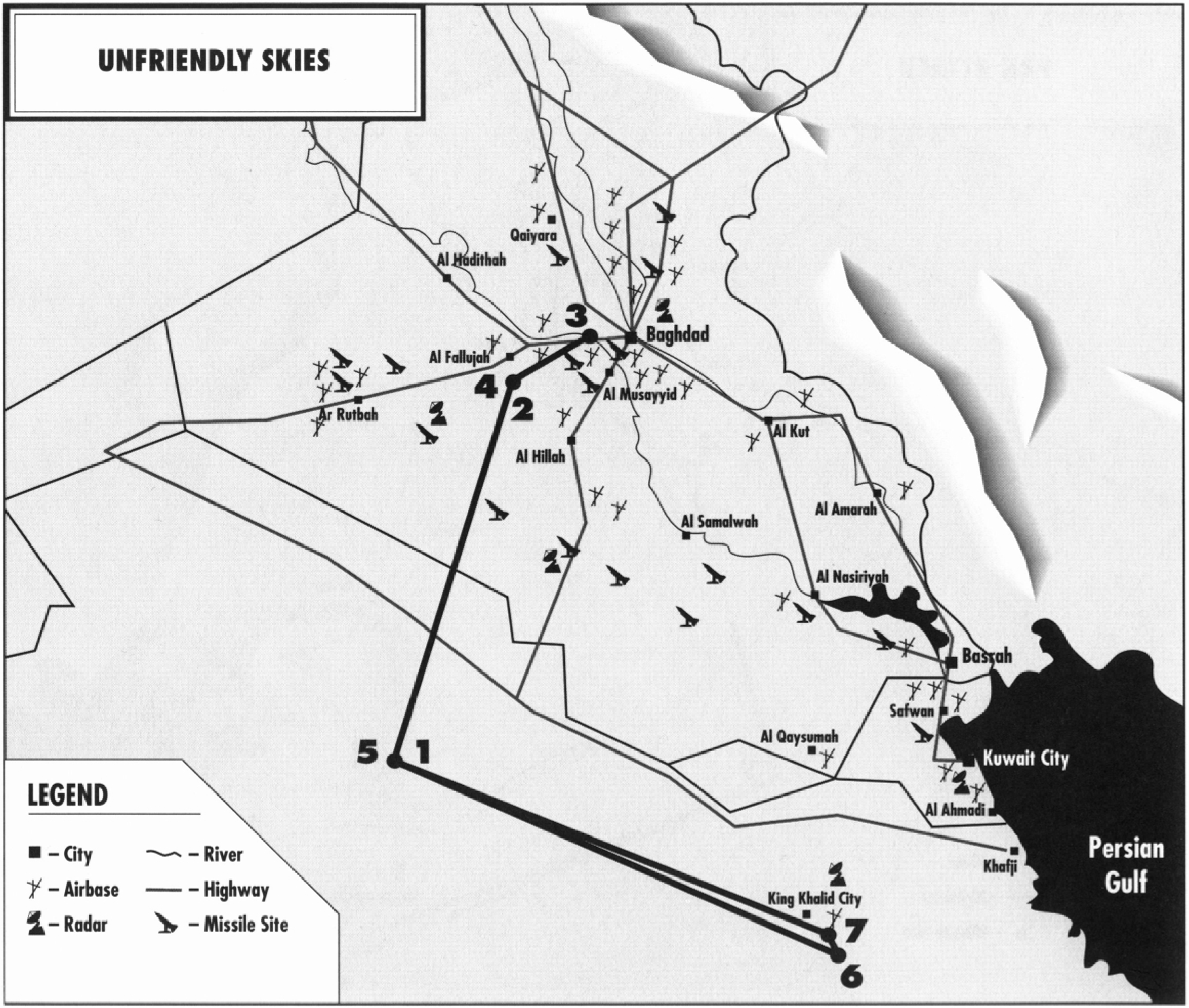

UNFRIENDLY SKIES

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Al Fallujah
Al Musayyid
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Al Amarah
Al Samalwah
Al Nasiriyah
Basrah
Safwan
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King Khalid City
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LEGEND
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– Airbase
– Radar
– River
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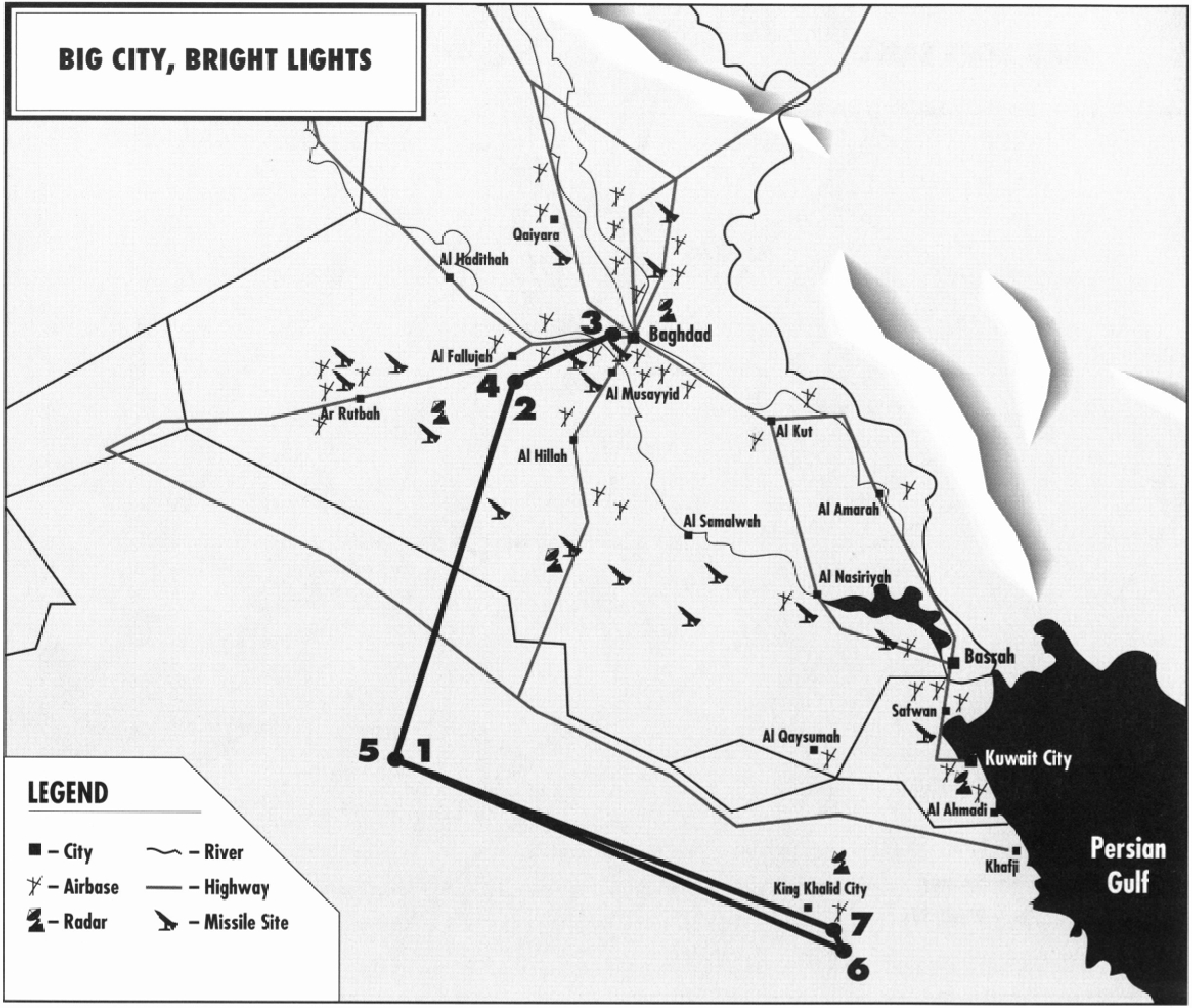
– Missile Site

BIG CITY, BRIGHT LIGHTS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LEGEND
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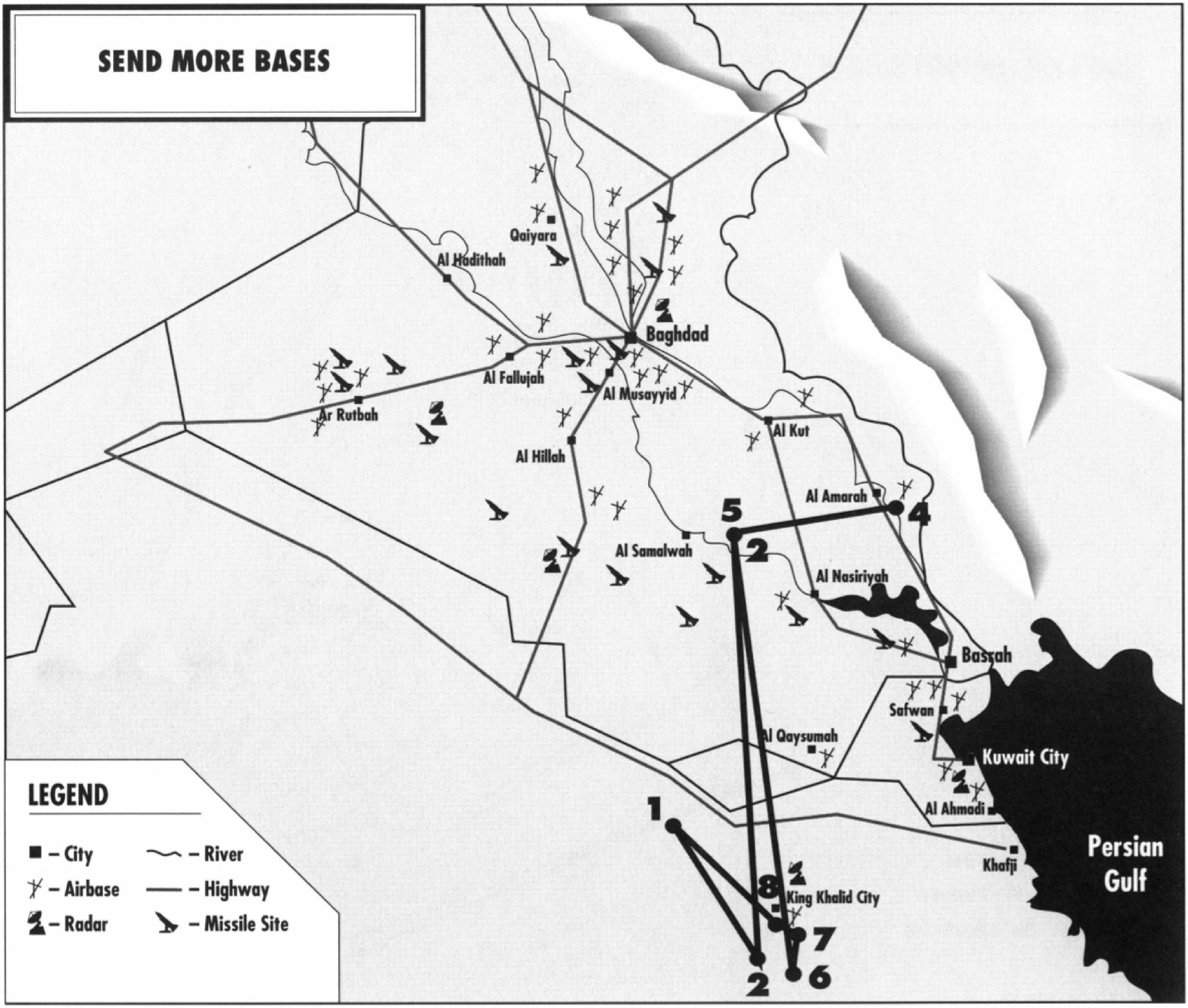
Airbase
Highway
Radar
Missile Site



SEND MORE BASES

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Al Hadithah
Baghdad
Al Fallujah
Al Musayyid
Ar Rutbah
Al Hillah
Al Kut
Al Amarah
Al Samalwah
Al Nasiriyah
Basrah
Safwan
Al Qaysumah
Kuwait City
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Persian Gulf
King Khalid City
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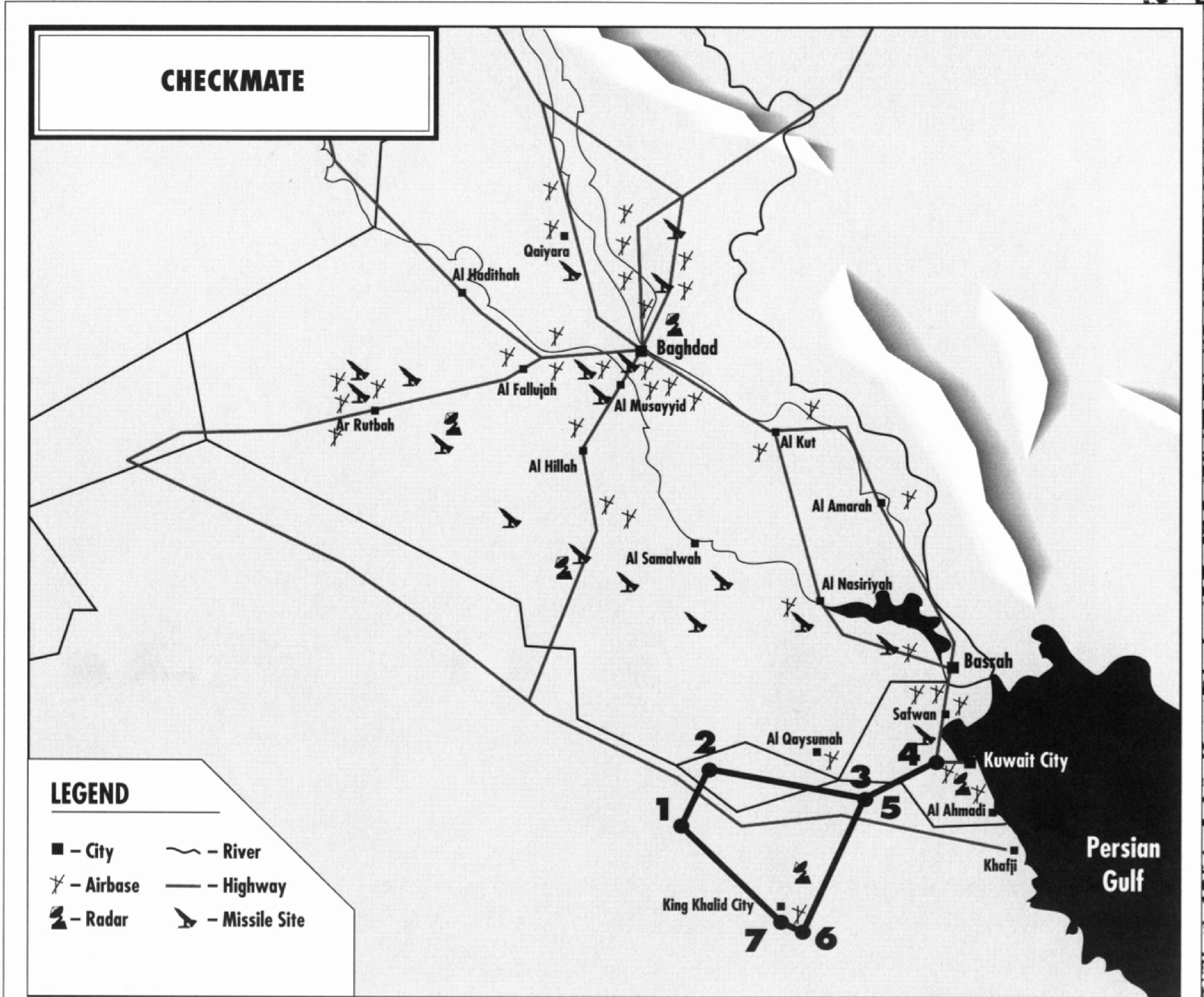
– Missile Site


CHECKMATE
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Al Nasiriyah
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Al Qaysumah
Kuwait City
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Khafji
Persian Gulf
King Khalid City
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LEGEND
– City
– River
– Airbase
– Highway
– Radar
– Missile Site

THREE-SIXTY PACIFIC, INC., 2105 SOUTH BASCOM AVENUE, CAMPBELL, CA 95008

MEGAFORTRESS

INSTALLATION & REFERENCE

INSTALLATION & REFERENCE

EQUIPMENT

Required

- IBM PC or 100% compatible
- VGA graphics card
- 640K available RAM
- Hard drive
- 5.25" floppy drive

Recommended

- Mouse (strongly recommended)
- Extra memory (RAM)
- Minimum 12MHz clock rate
- Sound card (AdLib sound-compatible)

INSTALLATION

1) Put disk 1 into drive A, type A: INSTALL
2) Tap <return>.
3) Follow the instructions that appear on the screen.

LOADING

1) Enter the MEGA directory created by the install program on your hard disk.
2) Type MEGA
3) Tap <return>.

MOUSE PLAY (LIMITED KEYBOARD)

It is highly recommended that a mouse be used to operate Megafortress. When the mouse is chosen as the prime selection tool during startup, all selections in the game can be made by moving the pointer to an item and clicking on it with the left mouse button. Selectable items can be buttons, switches, objects on radar screens, objects on camera view screens, or words on station monitor screens.

The right mouse button is used to cycle through information supplied to database displays associated with maps in the mission assignment screens, and the Navigator's MAP mode screen.

In addition, the "hot key" keyboard commands are available to the player from any station.

KEYBOARD PLAY (NO MOUSE)

A determined player can play the game without a mouse, using only the keyboard. This is not recommended, as the game often requires quick reactions that may be hindered by strictly keyboard-centered control—but it can be done.

Keyboard play is accomplished by using the arrow keys and space bar, three function keys, and the "hot" keys listed at the end of this guide.

Arrow Keys

The arrow keys operate in two modes to select items, and to maneuver the aircraft:

Mode 1: Selection

To select an item

1) Position the pointer over a selector (selectors can be buttons or lights on a panel, or words on a station monitor) as follows:
    a) Use the up- and down-arrow (panel selector) keys to move the game pointer from panel to panel within a screen.
    b) Use the left- and right-arrow or Tab and Shift-Tab (object selector) keys to move from selector to selector within a panel.
2) Tap the space bar.

For example, since the REGISTER panel is the only panel on its screen, only the left- and right-arrow keys will work, moving the pointer within the panel from object to object.

1) Tap the space bar while the pointer is positioned over the SELECT button; the currently highlighted pilot will be the registered pilot for the mission.
2) Tap the space bar while the pointer is positioned over a pilot name in the monitor; the name is highlighted.
3) Tap the space bar while the pointer is positioned over the REPLACE button, and the currently highlighted name is removed, allowing you to type in a new one (tap the return key to register the new pilot).

Mode 2: Flight Control

To fly the aircraft from any station

1) Tap the ALT key. The pointer will change into a small airplane symbol, indicating that the arrow keys can now be used to make the aircraft turn or climb and descend.
2) Tap the Alt key again to return the arrow keys to the selection mode.

Function Keys

Three function keys (F8, F9, and F10) are used to cycle through and select objects on the CRT monitors at various stations, as follows:

Pilot, Copilot, EW, and OW Stations

F10 .... With the monitors at any of these stations set to RADAR, tap F10 to cycle through the targets currently displayed.

Navigator Station

MAP mode, with the WAYPOINT selector turned off:

F10 .... Tap F10 to cycle through the type of information currently selected in the small monitor (borders, cities, and highways in CIV mode; radars, missiles, and bases in MIL mode).

MAP mode, with the INS selector switched to EDIT:

F10 .... Tap F10 to move the pointer to the currently selected waypoint on the large monitor, or, if the pointer is already on the map, tap F10 to move the currently selected waypoint DOWNWARD.

Shift-F10 ..... If the pointer is already on the map, hold down the Shift key and tap F10 to move the currently selected waypoint UPWARD.

F9 .... If the pointer is already on the map, tap F9 to move the currently selected waypoint to the RIGHT.

Shift-F9 .... If the pointer is already on the map, hold down the Shift key and tap F9 to move the currently selected waypoint to the LEFT.

F8 .... If the pointer is already on the map, tap F8 to move the pointer to the next waypoint.

Shift-F8 .... If the pointer is already on the map, hold down the Shift key and tap F8 to move the pointer to the previous waypoint.

The up- and down-arrow (panel selector) keys move the pointer off of the map to a new panel.

RADAR mode (to set a temporary waypoint)

F10 .... Tap F10 to move the pointer to the radar screen and change it to the temporary waypoint cursor,
or, if the cursor is already on the screen, tap F10 to move it UPWARD.

Shift-F10 ..... Hold down the Shift key and tap F10 to move the temporary waypoint cursor DOWNWARD.

F9 .... If the temporary waypoint cursor is on the radar screen, tap F9 to move it to the RIGHT.

Shift-F9 .... If the temporary waypoint cursor is on the radar screen, hold down the shift key and tap F9 to move it to the LEFT.

F8 .... If the temporary waypoint cursor is on the radar screen, tap F8 to set the temporary waypoint and return the pointer to the radar panel.

OW Station

SCAN or ATTACK mode:

F10 .... Tap F10 to cycle through the targets currently displayed.

CONTROL mode:

F10 .... Tap F10 to cycle through the missiles listed to the right of the monitor (representing the currently selected bay or pylon).

F9 .... For any missiles that operate in more than one mode (for example, the AGM-88A), tap F9 to cycle through the modes.

CAMERA mode:

F10 .... Tap F10 to cycle through the missiles listed to the right of the monitor (representing the currently selected bay or pylon).

F8 .... Use the 4-way camera switch to maneuver the camera until the target is centered under the green aiming cursor, and then tap F8 to lock the missile guidance system onto the target (a red box will appear if the lock-on is successful). Tap F8 a second time to release the lock.

HOT KEYS (AVAILABLE AT ALL STATIONS)

General

Pause	P
Return to Menus	ESC
Mission Orders	F7
Sound on/off	I
Engine sound on/off	O

Aircraft Controls

Pitch down	up arrow (in Flight Control mode for keyboard-only users)
Roll right	right arrow (in Flight Control mode for keyboard-only users)
Roll left	left arrow (in Flight Control mode for keyboard-only users)
Pitch up	down arrow (in Flight Control mode for keyboard-only users)
Increase Power	+ (keyboard "plus" sign)
Decrease Power	- (keyboard "minus" sign)
Autopilot (DAFCS)	A
TAC on/off	C
Increase TAC limit	V
Decrease TAC limit	X
Batteries on/off	U
Flaps	F
Gear	G
Taxi/Land Ratio	T
Parking Brake	B
Air Brake (airborne)	B

Interphone

Pilot Station	F1
Copilot Station	F2
Navigator Station	F3
EW Station	F4
OW Station	F5
External Camera	F6

Clock

GMT	D
ETA	E
START	S
RESET	R

Radar Monitors (Pilot, Copilot, EW, OW)

Zoom in	< (less than)
Zoom out	> (greater than)

STV Camera mode (Nav, OW)

Z	zero camera

Launch

Airmine	L
Flare	; (semi-colon)
Chaff	" (quote)
Current Missile	Enter
Select Next Missile	\ (backslash)

Time Compression

Normal	1
2x normal speed	2
3x normal speed	3
4x normal speed	4
5x normal speed	5

THREE-SIXTY PACIFIC, INC., 2105 SOUTH BASCOM AVENUE, CAMPBELL, CA 95008

Important Release Notes for Megafortress

Thank you for purchasing Megafortress. This addendum contains information not printed in the manual or installation and reference guide.

Installation and Reference Guide Addendum

Your Megafortress program disk contains compressed files. In order to play Megafortress, you must use the INSTALL program located on the Megafortress disk. The install program will decompress all of the files onto a hard drive only. If you wish to play Megafortress from a floppy drive or experience any other problems during installation, contact our Customer Service department at 409-776-2187. Depending on the type of floppy drive you have, they will send you one of the following:

1. One 1.2M and one 360K 5.25" disk

or

2. One 1.44M 3.5" disk

There will be no charge for these disks.

At this time, Megafortress is not directly playable from 720K 3.5" disks.

We apologize for any inconvenience this may cause.

Manual Addendum

1. Missing IFF codes on pages:

Page:		
56	- 06	(IFF code)
97	- 42	
98	- 60	
99	- 58	

We suggest you write the IFF code next to the corresponding page in the manual.

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MEGAFORTRESS™

1.2 Mb
DISK

IBM® PC and 100% compatibles

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MEGAFORTRESS™

1.2Mb

Operation Sledgehammer and Mission Editor
IBM® PC and 100% compatibles

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Software Warranty Registration

MEGAFORTRESS™

IBM & 100% compatibles

Thank you for purchasing this product. To be eligible for the 90 day product warranty, please answer all questions and mail within 10 days of purchase. Our Customer Service number is: **409-776-2187** M–F 9:00 AM to 5:00 PM Central Time.

Name ______________________________ Phone _______________

Company ____

Address ____

City ________________________ State __________ Zip __________

What hardware do you own?

☐ XT/Turbo
☐ AT/286
☐ 386/386sx
☐ 486
☐ Hard Drive
☐ CD ROM
☐ 3.5" disk drive
☐ 1.2Mb drive
☐ Modem
☐ Joystick
☐ Mouse
☐ Sound Card ________

How much memory is in your computer?

☐ 640K ☐ 1Mb ☐ 1.5Mb ☐ 2Mb ☐ 2.5Mb ______ Mb

What is the brand name of your VGA card? ____________ ☐ Don't know

How much memory does your VGA card have? ____________ ☐ Don't know

Age of buyer __________ M/F Age of player __________ M/F

Where did you purchase this product? ______________________________

Why did you purchase this product? ________________________________

What computing magazines do you read? ____________________________

What types of games do you enjoy? _________________________________

Where do you play MegaFortress? Home Office Both Other __________

What do you *like* or *dislike* about MegaFortress? (**L** for like, **D** for dislike)

L D Complexity
L D Ease of use
L D Different Theatres
L D Price
L D Interface
L D Sound
L D Overall value
L D Manual
L D Graphics

Comments: ____

____

____

____

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